AD NUMBER
AD333427
CLASSIFICATION CHANGES
TO: unclassified
FROM: confidential
LIMITATION CHANGES
TO: Approved for public release, distribution unlimited
FROM: Controlling Organization. Central Intelligence Agency, Office of Central Reference, 2430 E. Street, NW, Washington, DC 20505.
AUTHORITY
CIA ltr, 7 Sep 2004; CIA ltr, 7 Sep 2004

AD 333 427

CONFIDENTIAL

SCIENTIFIC INFORMATION REPORT

Biology and Medicine

(24)

Summary No. 4112

13 December 1962

Prepared by

Foreign Documents Division
CENTRAL INTELLIGENCE AGENCY
2430 E St., N. W., Washington 25, D. C.

CONFIDENTIAL

WARNING

THIS MATERIAL CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF THE ESPIONAGE LAWS, TITLE 18, USC, SECS. 793 AND 794, THE TRANSMISSION OR REVELATION OF WHICH IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW.

SCIENTIFIC INFORMATION REPORT

Biology and Medicine (24)

This is a serialized report consisting of unevaluated information prepared as abstracts, summaries, and translations from recent publications of the Sino-Soviet Bloc countries. It is issued in six series. Of these, four, Biology, and Medicine, Electronics and Engineering, Chemistry and Metallurgy, and Physics and Mathematics, are issued monthly. The fifth series Chinese Science, is issued twice monthly, and the sixth series. Organization and Amministration of Soviet Science, is issued every 6 weeks. Individual items are unclassified unless otherwise indicated.

Table of Contents

I. FEATURE ITEM

1. Partial Table of Contents of "Voyenno-Medisinskiy Zhurnal," No 7, 1962

The following is a reconstruction of the table of contents of Voyenno-Meditsinskiy Zhurnal, No 7, 1962, as cited in Letopis' Zhurnal'nykh Statey, Vil 38, 1962. The numbers in parentheses following the article titles refer to the title number in the yearbook.

Voyenno-Meditsinskiy Zhrunal, No 7, July 1962

II. BIOLOGY

Basic Biology

2. Chlorophyll Adsorption on Carriers

"A Study of Chlorophyll Adsorption on Organic and Inorganic Carriers," by L. I. Nekrasov, N. I. Kobozev, and G. G. Komissarov, Chemistry Faculty of the Moscow State University imeni M. V. Lomonosov; Moscow, Biofizika, Vol 7, No 5, Sep/Oct 62, pp 568-570

"Chlorophyll adsorption from alcohol solutions onto inorganic (alumina gel and silica gel) and organic (kapron) carriers was studied. A strong possibility for obtaining model systems of a chlorophyll adsorbent with different chlorophyll contents and varying orientations of its molecule on the surface of the adsorbent became evident.

"The isotherms that were obtained had a characteristic maximum which then branched to from a second maximum in the adsorption curve. The most likely prosulate is the one according to which the maximum in the adsorption curve is related to the reformation of the monomolecular layer from an initially flat layer where the chlorophyll molecules touch the edge.

"It was found that the area for each molecule on the surface of the kapron powder in the monomolecular layer was 400 Å sq. It was also determined that during chlorophyll adsorption on the alumina gel and on the silica gel in a monomolecular layer, only the external surface is covered, and this surface is about 0.3-0.4% of the surface of the molecule."

3. Evidence of Ancient Terrestrial Existence of Whales

"A Whale 'With Feet'"; Tbilisi, Zarya Vostoka, 3 Oct 62, p 4

"A Soviet whaler has caught an unusual whale in the Kurile Islands area. 'Feet' -- two paired outgrowths from the hip bones -- were found at the rear part of its body. Scientists regard this as an interesting example of atavism -- a reversion to progenitors.

"The find substantiates the face that whales lived on dry land.long ago."

4. Czechoslovak Discussion of Effects of Ionizing Radiation of Nucleic Acids

"The Effect of Ionizing Radiation on Nucleic Acids (A Comparative Study)," by S. Zadrazil of the Institute of Organic Chemistry and Biochemistry of the Czechoslovak Academy of Sciences, Prague; Prague, Neoplasma, Vol 9, No 4, 1962, pp 395-406

On the basis of present knowledge of the effect of ionizing radiation on nucleic acids, the author evaluates the changes observed in various RNA fractions from rats livers irradiated in vivo with X rays. In conclusion, the possible mechanisms involved in the decrease of the RNA content in the tissues following irradiation and the possible consequences of the structural changes of RNA for its biological role are discussed. (FOR OFFICIAL USE ONLY)

Biophysics

5. "Voice" of Neurons Recorded for First Time in USSR

"This is Interesting to Know"; Moscow, Trud, 26 Jul 62, p 3

"Billions of neurons, mocroscopic nerve cells, make up the spinal cord and the brain. Workers at the Laboratory of General Physiology of the Kiev Institute of Physiology, Academy of Sciences Ukrainian SSR, were the first in the country to penetrate a neuron, record its 'voice' on a magnetophone, and record on film the barely perceptible electrical processes which go on in the cell. To penetrate the neuron a special microelectrode was used. This was a very thin glass tube, 0.1-0.5 micron in diameter, filled with a solution of potassium chloride or another electrolyte

6. Biophysics and Plant Protection

"The Use of Biophysics in Plant Protection," by S. V. Andreyev, Materially Simpoziuma po Primeneniyu Biofiz. v Obl. Zashchity Rast. (Data From a Symposium on the Use of Biophysics in the Field of Plant Protection), Leningrad, 1961, pp 3-6 (from Referativnyy Zhurnal -- Miologiya, No 20, Oct 62, Abstract No 20G498)

"Theses. Data on biophysical methods of investigation and the practical use of biophysics in the protection of plants from diseases and pests."

Exobiology

7. Evidence of Life on Other Planets Claimed

"There Is Life on Celestial Bodies," by Docent Ch. Bayryyev and Docent S. Memedov; Ashkhabad, Turkemenskaya Iskra, 27 Jun 62, p 4

The authors claim experimental proof that life exists on other planets. Using a specially developed method, they isolated from meteorites a special species of superthermophilic microorganism, which they call a meteorite bacillus. Sufficient evidence to prove that the emergence of highly organized creatures was preceded by a definite stage of thermophilic organisms is claimed.

Ozone on the earth's surface has played an important part in the emergence of living organisms. In the opinion of Academician Vernadskiy, a living substance contains ozone. Life would not have emerged on earth if the atmosphere did not contain ozone because ozone absorbs the destructive ultraviolet rays of the sun. Consequently, thermophilic life must have emerged in an environment which is protected from radiation. It may be assumed that thermophilic life first emerged within a subterranean troposphere. But this gives rise to the question of the depths at which this life emerged, since at certain stages of development of the earth, the presence of intense radioactivity excluded the formation of life on it. The answer to this question was obtained in the course of an examination of ozocerite. This rare mineral has been found at a depth of 300-800 meters. The authors further reveal that a microorganism called the ozocerite bacillus was found by them 2 years ago. Up to that time, the ozocerite bacillus was unknown to science. It is possible to conclude from this that the existence of thermophilic microorganisms began at the level of formation of ozocerite. It may be argued that at such depths the temperature reaches a level of 100°C - 150°C and even higher. It has been claimed that life is impossible at such temperature levels; however, the authors of this article state that they conducted tests in an autoclave and found that ozocerite bacilli were not only able to tolerate temperatures above 150°C when pressure was from 7 to 8 atmospheres, but also were able to maintain their vitality.

On the basis of the data collected, it can be deducted that temperatures of 130°C - 150°C cannot be considered lethal for all microorganisms and living creatures.

The authors further concluded that life exists, in the form of thermophilic microorganisms, in asteriods and in particles and meteorites which fall from them and from large planets of the solor system. This conclusion is based on the fact that ozocerite and other carbon compounds

were found in a meteorite. Ozocerite bacilli and organisms similar to them are able to tolerate the same temperature as that of carbon-containing meteorites during their fall from asteroids to the surface of the earth.

Sources of food for ozocerite bacilli and ozocerite-like bacilli were found on carbon-containing meteorites. Water, which is necessary for existence of living creatures, was also found on these meteorites. Hence, there is a certain group of meteorites the temperature of which does not rise to the level at which living creatures could not survive.

8. A. I. Oparin Discusses Possibility of Life on Other Planets

"Life in the Universe; A conversation With Academician A. I. Oparin," by A. Lidov; Moscow, Moskovskaya Pravda, 26 Aug 62, p 3

"People are conquering outer space. Outer space has allowed man to enter: man has learned to overcome the unusual conditions encountered in outer space. And problems that held the attention of the world for thousands of years, problems of the structure of the universe and life on other planets, are closer to solution than ever before. This is what Academician A. I. Oparin, director of the Institute of Biochemistry imeni A. N. Bakh of the Academy of Sciences USSR told A. Lidov, the correspondent of our paper.

"Undoubtedly, flights into outer space offer a considerable possibility for the solution of the problem of whether life exists on other planets. The experience of the first cosmonauts permitted the thorough preparation of A. Nikolayev and P. Popovich for a cosmic flight that lasted several days. The creation of conditions under which individuals physiologically different from one another can preserve fully their health and efficiency under conditions of weightlessness, makes it possible to expect that flights to the moon and subsequently to Venus and Mars will be possible in the not too distant future. It will then be possible to determine in a strictly scientific manner whether there is any form of life on those planets. There are many hypotheses concerning life on Venus and Mars, but they are only educated guesses.

"Considerable information is now available concerning the structure of upper layers of the atmosphere and ionosphere. Outer space contains very rarefied hydrogen. A huge accumulation of the gas-dust mixture present in outer space forms so-called outer space clouds. What interests me here personally is that methane is present in this gas-dust mixture even at zero temperature.

"This hydrocarbon may be regarded as one of the raw materials involved in the evolution of matter during the emergence of life.

"The space age introduced new methods of research. It spurred numerous and varied studies of bodies of extraterrestrial origin: meteors. Soviet geologists are reporting new data that concern the possibility of the formation of hydrocarbons without life being present. We are synthesizing in our laboratories protein-like and nuclein-like substances. Albumin and nucleic acid are the principal raw materials necessary for a qualitative leap from nonliving matter to living matter. Synthesizing these substances without living cell participation, we are more or less imitating the processes that took place on earth billions of years ago. We have made considerable progress in this respect. Furthermore, we are obtaining data concerning the physical and chemical constitution of planets and stars and concerning the presence of hydrocarbons and organic substances on them. These studies are being conducted with the aid of spectral analysis and radiowaves.

"Studies conducted beyond the limits of the earth's atmosphere are extremely important because the layer of atmosphere protects our earth from the harmful effects of cosmic radiation. Flights in outer space may help us to determine whether life exists beyond the earth and the manner in which life emerged in the Universe. What kind of an extraterrestrial life is there: Is it the same kind of life as is known to us on earth or is it different? The future will tell."

Genetics

9. Chemical Role Seen in Heredity Changes

"Against Poor Heredity"; Moscow, Nedelya, 2-8 Sep 62, p 11

"Some students of biology in the West reject, as a matter of principle, the possibility of complete cure of hereditary diseases.

"This point ofview is being conclusively disproved by scientific data obtained as a result of observations of medicobiological changes that occur in outer space. Soviet scientists have established that ceratin chemical substances are able to reduce the effect of radiation on the nucleic acids of bacteria. These substances had a stabilizing effect on the nucleic acids of bacteria which were aboard space vehicles, and they guarded them against possible future hereditary changes.

"Research conducted by N. N. Zhukov-Verezhnikov, V. I. Yazdovskiy, A. P. Pekhov, P. L. Saksonov, N. I. Rybakov, V. A. Kozlov, G. P. Tribulev, and other medical scientists and biologists deals with 'hereditary diseases' peculiar to micro-organisms.

"Thus, Soviet researchers have proved that it is possible, in essence, to correct the chemicogenetic defects of nucleic acids with which transmission of hereditary properties is connected. It paves the way for prevention of hereditary diseases in the future."

Microbiology

10. Rapid Detection of Anthrax Pathogen

"The Question of Accelerated Indication of the Anthrax Pathogen by the Use of Antibodies Tagged With Fluorochromes," by K. F. Busygin, Uch. Zap. Ka zansk. Vet. In-ta (Scientific Notes of the Kazan Veterinery Institute), No 81, 1961, pp 45-51 (from Referativnyy Zhurnal -- Biologiya, No 19, Oct 62, Abstract No 19B436)

"The possibility of accelerated indication ob Bacillus anthracis in water by the use of fluorescing antibodies and differentiation of Bac. anthracis from soil saprophytes similar to it in antigenic structure was investigated. The 'indirect' method of staining the preparations according to Kuhne was used to indicate the pathogen. Globulins immune to horse serum were obtained from rabbits by subconjunctival hyperimmunization (the Chinese method). Serum with a precipitation reaction titer of not less than 1:1000 and with a protein content of 16.5 mg per one ml was used for conjugation. A virulent culture of B. anthracis treated with anthrax precipitating and rabbit antiglobulin serum tagged with fluorescein isocyantte emitted specific greenish luminescence with clearly defined luminescent contours. The 'indirect method of tagging microorganisms in conjunction with dilution with untagged precipitating anthrax serum gave encouraging results for differentiating Bac. anthracis from soil saprophytes. The author indicates a number of advantages of the 'indirect; method over the 'direct.'"

11. Typing of Foot-and-Mouth Disease Virus

"Experience in Obtaining Foot-and-Mouth Disease Virus With Different Type Characteristics," by V. I. Kindyakov, S. M. Filippovich, and V.K. Savin, Tr. N.-I. Vet. In-ta Kazakhsk. Akad. S.-Kh. Nauk (Works of the Scientific-Research Veterinary Institute, Kazakh Academy of Agricultural Sciences), No 10, 1961, pp 51-55 (from Referativnyy Zhurnal -- Biologiya, No 19, Oct 62, Abstract No 19B77)

"When there is a determined combination of a mixture of OA virus types, it is possible to observe virus with antigenic properties of OA types to an equal extent in infected animals in the first two passages,

although the presence of O or A types or a mixture of them with a predominance of one or the other was noted in some of the infected animals. It is possible to obtain virus of the two types (O and A) simultaneously from the animals in equal amounts, which has great significance for preparing a vaccine. Bivalent vaccine prepared from the same virus according to the method of the Kazakh Scientific-Research Veterinary Institute was highly effective. A change in the antigenic properties of the virus in subsequent passages toward predominance of type A was evidently connected with the immunological condition of the animals."

"The Problem of Typing Foot-and-Mouth Disease Virus," by K. A. Arifdzhanov, Tr. Uzb. N.-I. In-ta Veterinarii (Works of the Uzbek Scientific-Research Institute of Veterinary Medicine), No 14, 1961, pp 3-5 (from Referativnyy Zhurnal -- Biologiya, No 19, Oct 62, Abstract No 19B78)

"A new method based on the introduction of standard strains of virus to mice 5-8 days old is suggested. A suspension of killed mice is passed through a Seitz filter and introduced intravenously to rabbits to activate rabbit serum. The methodology of determining the virus strains is given in detail."

Ornithology

12. Biological Station Studies Migratory Birds

"The Secret of the Winged Nomads," by G. Krasnogor, Rybachiy poselok, Kaliningradskaya Oblast'; Moscow, Komsomol'skaya Pravda, 1 Sep 62, p 4

A biological station of the Zoological Institute, Academy of Sciences USSR, located in the Rybachiy poselok, along the Kursky gulf (kaliningradskaya oblast', Lithuanian SSR), is studying the habits of migratory birds to discover the answers to the following questions:

1. What compels birds to leave their nests every spring?
2. How do birds know what direction to fly, when migrating and when returning home?
3. Where do birds get the energy for such long trips?
4. To what extent can birds become vectors of diseases?

As part of the program to determine the direction and distance of migrations, migratory birds are snared and banded and their age and wing-span recorded. The bands are later returned to the station from many parts of the world.

The author reports that workers at the station have determined the amount of fat expended by a bird during flight. After weighing the birds and binding their beaks to prevent them from eating, they set them free at a distance greater than 10 km from the station. They learned that "...during a flight of 50 km (approximately the distance covered in an hour), a swallow loses from 170-250 milligrams of fat. Thus, a bird weighing 3-4 grams could remain in the air for 2 days without feeding and could cover a distance greater than 1,000 km."

The author notes that the "efficiency" of birds is quite high. Whereas an engine requires a very high temperature for the conversion of heat to mechanical energy, the temperature of a bird's body remains an even 41-42°C. V. R. Dol'nik, the oldest laboratory assistant at the station, is studying the physiology of migration and the energy balance of birds. "The problem of the effective utilization of engergy, as it is observed in birds, has never been resolved. In all his history, man has never been able to create a machine which was capable of rising into the air, using as little energy as a bird uses." Thus, the author concludes, the work in this area is quite important.

Radiobiology

13. Czechoslovak Discussion of Effects of Radiation

"Radiation and Living Matter," by Milan Pospisil; Prague, Veda a Zivot, No 10, Oct 72, pp 575-577

The article discusses the effects of radiation on living matter. Czechoslovak work in this field is briefly considered, e.g., the author states that studies conducted at the Institute of Biophysics of the Czechoslovak Academy of Sciences in Brno have shown that in otherwise identical subjects, higher metabolism, which is manifested in higher overall consumption of oxygen, is an unfavorable factor in the severity of the effects or radiation on a living organism.

Miscellaneous

14. Book on Formation of Dialectic Conception Development in Biology Reviewed

Vozniknovenie i Formirovanie Dialekticheskov Kontseptsii Razvitiya v Biologii (The Origin and Formation of the Dialectic Conception of Development in Biology), by A. Yc. Furman, reviewed by M. M. Abrashnev, Department of Philosophy, Gor'ki Medical Institute imeni S. M. Kirov; Moscow, Filosofskie Nauki, No 4, Mar/Apr 62, pp 114-116

The author attempted, the reviewer begins, to trace, in relation to the accumulation of biological knowledge, the origin and formation of the dialectic conception of the development of the organic world. In general, the reviewer is quite satisfied with the author's treatment of his subject.

The author proposes the following scheme as an approximate periodization of the history of biological science:

1. The period of description and systematization of organic forms and life phenomena, beginning with biological knowledge which was still intertwined in practice and ending with the isolation of biological knowledge into a special branch of natural science (including the 18th Century).

2. The period of the basing and assertion of the idea of the development of organic forms (in essence, the Darwinian period).

3. The period of the disclosure of the material basis of life phenomena and the elucidation of the causes and laws of heredity and its variability; Michurin's teachings and their struggle against Mendelism Morganism; the creation of the dialectic-materialistic conception of development in biology.

The reviewer finds fault with what he terms the author's weak analysis of the dialectic conception of development. He feels that the author should have considered the natural-philosophic and elemental forms of dialectics and their relation to the dialectic conception of development. Sometimes, the author expounds purely biological material about the origin of living beings and does not give it a philosophical valuation.

Another defect of the book is that the author does not show the formation of dialectic ideas in biological science in Russia.

This book, the reviewer notes, is intended to be the first part of a work entitled "The Dialectic Conception of Development in Biology." The characteristics of the basic features of the dialectic conception of development in contemporary biology will be given in the second part.

15. Support Found in Lenin for Definition of Mental Activity As Reflection of Material World

"The Question of the Nature of Mental Activity in the Light of the Classical Works of Marxism," by P. I. Razmyslov; Moscow, Filosofskie Nauki, No 4, Mar/Apr 62, pp 101-105

In this article, the author refers to works of Engels and Lenin to substantiate the view that mental activity is always an ideal reflection of the material world in the brain of man.

The author mentions several Soviet authors who do not accept this view of mental activity. In the gnoseological plan, these authors also see mental activity as an ideal reflection of the material world, but in a natural science or ontological plan, mental activity to them is a special, higher form of the motion of matter, a form of existence. Of this theory and others like it, the author says that by limiting the Marxist-Leninist theory of reflection to the sphere of philosophy, they inevitably lead theoretical thought backwards.

To support his own definition of mental activity, the author refers to many statements by Lenin. For example, he asserts that Lenin used the following expressions: mental activity is a product of the long development of the material world; it is secondary, matter is primary; mental activity is a function of the working brain; mental activity is a property of highly organized matter -- the brain -- which is expressed by the reflection of the external objective world.

III. CONTROL SCIENCES

16. Conference on the Philosophical Questions of Cybernetics

"Philosophical Questions of Cybernetics," by B. F. semkov; Moscow, Vestnik Akademii Nauk SSSR, No 9, Sep 62, pp 128-131

"Many complex methodological and philosophical problems are connected with the development of the new scientific discipline, cybernetics. These problems are given a great deal of attention in discussions of cybernetics. They provoke the deep interest of scientists of various specialties. It is for this very reason that the Theoretical Conference of Philosophical Seminars of the Scientific Institutions of the Academy of Sciences USSR (1-2 July), which was devoted to philosophical questions of cybernetics, attracted more than 1,000 people, of whom more than 200 came from other cities of the country.

"Academician A. I. Berg, who opened the conference, underlined the great significance which the Party Program attached to the development of cybernetics and to the application of its achievements in industry, research, construction and design, planning estimates, the sphere of accounting, statistics, and management. Having set forth the problems which confront cybernetics, A. I. Berg called on the conference to concentrate its efforts on the generalization of the accumulated achievements, on the correct valuation of these from the position of dialectical materialism, and on the definition of the ways of further accelerating the development of this new important scientific discipline. He drew attention to the necessity for a close relation between the study of philosophical questions of cybernetics and life and the practical development of science and engineering.

"A new definition of cybernetics, free of the concepts 'control' and 'information,' was given in the report of A. A. Markov. Cybernetics, in his opinion, can be treated as a general theory of causal networks, which studies them with a precision approaching isomorphism. In the cases examined by cybernetics, the problem reduces to a system consisting of a finite number of 'nodes,' each of which can be in a finite number of states. Within a state of the nodes there occur causal relationships which are in effect for a time which is seen as discrete, divided into 'measures.' Along with 'rigid' causal relationships, the author allows the presence of 'flexible' relationships and probable causal relationships -- non-Laplacian determinants -- in the causal networks.

"The central problem of cybernetics in connection with this, in the opinion of A. A. Markov, is the problem of the synthesis of the causal networks -- structures of the given elements of the causal

networks which react to external influences in a given manner. Allied to this is the problem of control of the causal networks -- the problem of the proper organization of the external influences on an existing causal network with the purpose of obtaining the required result.

"According to the author the definition does not claim to include everything presently grouped under the name 'cybernetics.'

"The question of the subject matter of cybernetics was also broached by A. A. Lyapunov and S. V. Yablonskiy, who analyzed in detail the state of development of the theoretical aspect of cybernetics, showed the level that has now been reached in this area, and disclosed prospects for further research. Generalization and systematization of the existing achievements allowed the authors to compile a detailed table of the problems of cybernetics, which illustrated very well the idea of the community of the laws of control in various phenomena of nature and social life (biology, economics, engineering, linguistics) and convincingly showed the groundlessness of attempts by opponents of cybernetics to lower its stature as a science related to the most diverse fields of knowledge and to confine its use to engineering.

"The conference focused special attention on the application of cybernetics to phenomena of animate nature and the human psyche rather than in engineering (where its successes are already widely known).

"The reports of A. N. Leont'yev and Ye. P. Krinchik, 'On Some Characteristics of the Handling of Information by Man,' and Ye. N. Sokolov, 'The Modeling of the Properties of Nervous System Stimulators,' were constructed on just such a plan. They showed the level of theoretical and experimental work in the application of the principles and methods of cybernetics in research on physiological problems and in the study of the psychic activity of man and his nervous system.

"A. A. Lyapunov, in his report 'On Control Systems in Animate Nature and a General Concept of Life Processes,' disclosed quite thoroughly the substance of the cybernetic trend in biology. Underlining the fact that it has as its goal the development of a total understanding of living phenomena, starting with ideas about the structure of organisms and of elementary vital acts, A. A. Lyapunov suggested his own definition of life as a highly stable state of matter, utilizing information coded by the states of separate molecules for the development of defense reactions. As examples, he showed the

broad possibilities of the utilization of this definition in solving the very pressing problems of contemporary biology. He emphasized the fact that many modern achievements in biochemistry and genetics can be explained by the application of cybernetic methods. The deciphering of the biomechanism of the work of the gene, for example, consisted of the elucidation of the system of recoding information from desoxyribonucleic acid (DNA), which is its initial carrier, to the protein, the primary macroscopic carrier of information, the chemistry of which is determined by the microscopic characteristics of the cell. The nature of the recoding of information from the language of DNA to the language of amino acids is cybernetic in essence.

"At the conference, they were able to discuss the problem "the brain and the machine' on a scientific basis. Earlier discussions of this problem had had a basically emotional character. The experiments which had been carried on during the past years provided sufficiently weighty foundations for this. The report of V. M. Glushkov, 'Thinking and Cybernetics,' was constructed from just this point of view. He focused attention on the disclosure of possibilities for using cybernetic methods in understanding the rules of thinking and, above all, the possibilities of modeling thought processes. Having shown that at the base of the concept of the information converter, as, applied in cybernetics, this question has been framed anew, V M. Glushkov came to the conclusion that any form of human thinking can be modeled in an information plan in artificially created cybernetic systems, even if these be limited to systems built on the already known principles of program control.

"The question of the possibility of a machine being 'wiser' than its creator ought to be considered dialectically, V. M. Glushkov stressed. In some areas of human mental activity, for example, in the planning of the national economy, such a possibility has turned from a subject for discussion into an important practical task. In part, this refers also to scientific creation, most of all to the exact deductive sciences.

"The dialectics of the process of training (the task of the program) are such that it does not necessarily follow from the ability of man to train any kind of machine that the trainer himself is able to fulfill the program that he has put into the machine. The machines have the possibility of ascertaining new facts which are completely unknown to their creators. This possibility has already been applied in the simplest programs, utilizing the conditioned switching operation, and is broadened both quantitatively and qualitatively according to the magnitude of the complexity of the program.

"Having put into the machine information about the basic laws of the development of life (heredity, mutation, natural selection) and having let pass through it information about the physical processes which occur on earth, it is in principle possible to make the machine (it is understood, in a purely information plan) pass through all stages of evolution up to the origin and development of as high a form of consciousness as one wants. A similar experiment, though on a limited level, was conducted in the Computing Center of the Academy of Sciences USSR and gave very interesting results.

"In the future, V. M. Glushkov said in conclusion, to a greater and greater extent, a significant part of the laws of the world surrounding us will be understood and utilized by man's automatic helpers, surpassing human consciousness. However, the most important things in the thinking processes and cognition will always be the lot of man.

"Highly interesting information on the development of the thesis suggested by V. N. Glushkov was set forth in the reports of A. A. Fel'dbaum, 'The Processes of Training People and Automatic Machines,' and L. N. Land, 'Cybernetics and Some Ways To Rationalize Training.'

"A. I. [sic] Kolmogorov, in his report 'Life and Thinking From the Point of View of Cybernetics,' defended the viewpoint of the completely unlimited possibilities of modeling any complicated organized material system on the basis of the achievements of contemporary computing technology and asserted that the definition of life and thinking should be freed from arbitrary premises about the concrete physical nature of the physical processes under-lying them. He came to the conclusion that a modeling of the method of organization of a material system cannot consist of anything other than the creation from other material elements of a new system possessing its essential traits the organization of the modeled system. Therefore, a sufficiently full model of a living being ought in all fairness to be called a living being, and the model of a thinking being, a thinking being.

"The author of the report, together with Yu. Ofman, was studying a theory of discrete automata with a constant number of simple elements and with a constant structure of connections between them. Such automata are capable of modeling other automata of a similar nature or self-designing systems, i.e., analog setups, capable of varying their sturcture and adding new elements to themselves. They also studied the question of the existence of universal automata of constant structure, within the limits of which it is possible to model the evolution of any self-designing system, up to the point where the number of elements entering it does not exceed a given number.

"N. G. Bruyevich, A. I. Uyemov, I. B. Novik, S. M. Shalyutin, L. P. Bazhenov, V. S. Kazakovtsev, Sh. K. Abzishvili, and N. N. Vorob'yev also devoted their speeches to the problem 'the brain and the machine.' The discussion showed that there are still not enough bases for the simple resolution of this question.

"The discussion of the questions raised at the conference helped to distinguish the most important philosophical problems of cybernetics, on the study of which efforts ought to be concentrated in the future.

"Highly valuable in this plan was the speech of N. A. Anokhin, who directed attention to the necessity of analyzing philosophically the question of the general laws of the mechanisms of various classes of phenomena as the basic principle of cybernetics. It is necessary to explain why phenomena of such varied types, which we have shared qualitatively in our worldly works, have a common core and a common architecture, making it possible to compare, confront, and adjust the laws of one type of phenomena to the laws of another. G. V. Linkovskiy particularly emphasized this very aspect of cybernetics in his report.

"It is appropriate to recall here that V. I. Lenin attached great significance to the question of unity of the laws of nature. In his work 'Materialism and Empiriocriticism,' drawing attention to the statements of Boltzman that it was possible to resolve questions of hydrodynamics and to express the theory of potentials by one and the same equation and also that the theory of the movement in liquids and the theory of the friction of gases show a striking analogy with the theory of electromagnetism, he wrote: 'The unity of nature is revealed "in the striking analogy" of differential equations which are related to various fields of phenomena.'

"Cybernetics, studying the common laws, provides rich material for philosophical generalizations in the field of the development of the problem of the unity of nature. One can scarcely doubt that in the first instance the attention of scientists studying the philosophical problems of cybernetics ought to be riveted to this very question.

"The answer to the question of the community between man and nature also ought to be sought in this very direction of the disclosing of the unity of nature. The ways of understanding, with the help of cybernetics, the laws of the activity of the application of the received results for the creation of still more complete cybernetic systems, which were projected at the conference, will facilitate philosophical generalizations in this direction further on. The report of I. B. Novik, 'On the Nature

of Information and the Peculiarities of Cybernetic Modeling,' had a direct relation to the thesis advanced above. He raised the question of the relation of a cogent approach to the information process to the property of reflection, well-grounded by Lenin in his work 'Materialism and Empiriocriticism.' The cogent approach to information, considering it as controlled reflection, leads to a number of consequences which are interesting with respect to methodology. With such an approach, an objective criterion for the comparison of the comparison of the activity of the brain and the work of a cybernetic machine is revealed. The philosophical position on the total materialistic attribute of reflection, in the opinion of I. B. Novik, gets its natural-science confirmation and development in cybernetics.

"The participants of the conference turned attention to the importance of further development, taking into account the data of cybernetics, of such philosophical categories as expediency, chance and necessity, and the objectivity of information and the category of distinction and complexity.

"As a result of the highly cogent discussion, the conference adopted a plan of research on the philosophical questions of cybernetics, placing at the very beginning more organized work in this direction."

17. A. I. Berg Discusses Role of Cybernetics in Space Flights

"Cybernetics in the Cosmos," by Viktor Bukhanov; Moscow, Vechernyaya Moskva, 21 Aug 62, p 2

The text of this article is a statement made by A. I. Berg to the reporter about the role played by cybernetics in the recent "twin space flights of the USSR.

"To begin with," Berg says, "I would like to compare two phenomena: the American project 'West Ford' and the connection that was established between 'Vostok-3' and 'Vostok-4.' To study the dissemination of radio waves in the atmosphere, the scientists of the US intended to throw out into the cosmos metallic needles and foil. This would have been a conscsious and criminal obstruction of the cosmos. Such an intention spoke not only of their well-known egosim, but also of direct diversion for the purpose of distrubing radio communication among the countries of the world.

"Like the poisonous experiments in the upper layers of the atmosphere, 'West Ford' has nothing in common with science. As is well-known, the Americans' first attempt to throw out the needles did not succeed, and they have abandoned further attempts for the time being under the influence of the world's progressive scientists."

Among the greatest achievements of the recent space flight, in Dr. Berg's opinion, were the connection between the two cosmic ships and the television connection which was established between the cosmonauts and the earth. However, he continues, in his opinion, one thing predominates over all other achievements: the tremendous, incomparable reliability of the apparatus. Again concerning the US: "They have never achieved and, it is clear, for the time being never will achieve as high a reliability of the mechanisms of the space ship as we have achieved. 'Vostok-3' and Vostok-4' demonstrated in the course of several days the maximum reliability of the most complex, one could even say refined, apparatus.

"Cybernetics is everywhere (in the recent space flight): from take-off to landing, from calculation of the orbit to medical control. All elements of cybernetics are present: the collection of information, the transmission it back to earth, the utilization of it on the spot.

"It ought to be mentioned that cosmic flight is one of the most difficult fronts in the application of cybernetics. The difficulty lies most of all in the distance of the ship from the computing centers that are guiding the flight.

"Here again the startling reliability and exactness of the apparatus appeared. At a temperature close to absolute zero, the airconditioning on board the ship, in the cabin, was kept with exactness within 1-2 degrees of room temperature. I repeat, from take-off to landing the ship was in the realm of cybernetics."

The possibility of the active interaction of two (and, subsequently, several) cosmic ships and the reciprocal control and coordination of activity, Dr. Berg concludes, will enable the Soviets, in time, to start mounting artificial cosmic observatories and starter platforms for the starting of interplanetary ships. It is possible to suppose that the time is not far off when whole squadrons of ships, piloted by men, will ascend -- whole expeditions, mastering the space of the universe.

18. Cybernetics Plays Important and Varied Role in Space Flights

"The Cosmos and Cybernetics," by Andrey Prokhorov and Il'ya Zakharov, Members, Scientific Council on Cybernetics, Academy of Sciences USSR; Tbilisi, Zarya Vostoka, 18 Aug 62, p 3

Cybernetics plays an important role in all aspects of the problem of space research and space flights. Instead of using drafts and experimental models in the construction of technical systems, it was possible to model these with the help of computing machines.

Cybernetics was utilized in the creation of preflight training machines; in the choice of optimal construction for the space ship, taking into account a large number of factors; the control of the entrance of the ship into orbit; and control to ensure the fulfillment of the complicated program of the flight.

Cybernetics provided specialists in cosmic medicine with methods for the exact analysis of human physiological processed under various conditions. This analysis, in turn, influenced the construction of the space ship and also made it possible to select those people who would be most fit for the flight.

In the problem of control over the actions of the ship, cybernetics again led to a solution. "It worked out machines which were capable of independently adjusting themselves to a quickly and unexpectedly changing situation, capable of independently analyzing information received from sensing transducers, with the goal of using it for the realization of effective control."

"Cybernetics, considering the human organism as a complicated self-governing system, put in the hands of cosmic psychology methods for the solution of the most difficult problem -- the guaranteeing of the normal psychic condition of the cosmonaut during long flights."

Soviet scientists feel that communication ties alone with the earth are not enough and that, for lengthy flights, people must be sent up in a group, so that the cosmonaut will not feel completely alone and cut off from everything.

"Completely self-governing cybernetic machines will be the first to be sent out on interplanetary voyages. They will impart their observations to earth, with the help of radio and of television transducers. They will independently realize the complete control of the ship."

19. Cybernetics in Medicine and Space Flights

"Journey Into the Unknown," by V. V. Parin, Member, Academy of Medical Sciences USSR; Moscow, Literaturnaya Gazeta, 7 Aug 62, pp 2, 4

The author speaks of the various applications of cybernetics in medicine and space flights. He cites work on the creation of diagonostic machines as one very important trend in medical cybernetics. The problem here is to create a machine which is capable of distinguishing among diseases which have very similar symptons, rather than one that gives simple "yes" and "no" answers. For example, there are more than 100 congenital and acquired heart diseases. To create a machine capable of distinguishing among these, the programmist-doctors, in choosing "questions" for the machine, were forced to an understanding of the necessity of reorienting both medical thinking and the system of examination of the patient and evaluation of the data received; that is, the process of the mathematization of biological concepts and the more precise definition of the "limited significance" of separate indexes were begun.

Cybernetic technology has also given doctors new "sense organs." These are electronic apparatus capable of registering phenomena which neither the physician's senses nor his conventional instruments can record.

These instruments have a very important application in space flights. With their help, medical control over the condition of the pilot of the space ship is possible. During the flight of the second sputnik, information about the rate of the breathing, pulse, biological currents of the heart (EKG), and other physiological parameters of the orbiting animals was radioed back to earth, where it was decoded and evaluated.

But, the author continues, a system which could process the signals right on board the ship would be much more valuable. Then the automatically received estimate of the condition of various systems of the organism would be relayed to earth. If some disorder should occur in the pilot's organism, the doctors would be able to take the necessary countermeasures very quickly.

The creation of such diagnostic machines demands a lot of work. It is necessary to determine which deviations in the function of the body's systems can be considered "normal" and which "pathological." These data can be determined from earth models and from training in centrigufes and rotors. It is evident that in time "machine prognosis" will taa place right on the ship, and the doctor of the expedition and the pilots of the ship will introduce correctives into the course of the flight.

The task of cybernetics in the mastering of the cosmos is not so much to replace man in mechanical forms of labor as it is to replace (and help) him in those areas where the physiological possibilities of his activity are limited. For instance, man's reaction time is too slow to enable him to take complete control of the ship.

In the opinion of the author, the creation of reliable systems of automatic control or, more broadly, the problem of reliability is the most important task of contemporary technology. It is natural that for the solution of this problem cybernetics has turned to the study of the brain because its functional wealth and reliability more than compensate for its slowness. It is also natural that in the modeling of this system, created and perfected by nature, cybernetics has seen the means to the resolution of a great number of technological problems. Thus the special field of science and technology, "bionics" -- biological electronics, studying the possibility of modeling "living" natural systems, was created.

The author notes that while some scientists hold that the possibility of modeling the processes of human thinking contradicts known philosophical truths, he believes that for scientist-materialists, occupying strict positions of causality, the possibility in principle [last three words in heavy type in the original] of reproducing even the most complex material process is indisputable.

20. Cybernetics and the Problem of Reliability in Control Apparatus

"Reliability of Cosmic Flight," by A. G. Ivakhnenko, Corresponding Member, Academy of Sciences Ukrainian SSR; Moscow, Vechernyaya Moskva, 30 Oct 62 p 3

The article is devoted to a discussion of various ways to achieve reliability in control apparatus, with special emphasis on the role of cybernetics and the control of cosmic flights. In addition to the

continuing improvement of the construction and the technology of preparation of separate details of the apparatus, there are at least three ways to create reliable systems which consist of relatively unreliable elements.

The first of theses is the duplication of the elements of a system, so that if one element ceases to function, another automatically replaces it. This system is not feasible in cosmic ships, as the duplication of elements would increase the weight of the ship.

The second way in which the reliability of an apparatus can be assured is by the principle of functional abundance. This method is borrowed from nature; one example of it is a mammal's teeth, which can function properly even when more than half are gone.

The third means of ensuring reliability is by the principle of auto-redistribution of the functions of the elements of the system. This method is also borrowed from nature. It is the subsequent development of the idea of functional abundance. When one element in the system ceases to function, the others not only take its function upon themselves, but also reorganize and change their "qualification" in order to ensure the viability of the system using the smallest number of elements.

This is the way that complex cybernetic adapting systems of the so-called "biological" type work. At a high enough degree of organization, they are also capable of handing over the functions of the disabled part to any other part, as long as the structure of such systems is basically homogenous. In them, order arises spontaneously from the chaos of a huge quantity of micro-elements. A system of the "biological" type decides itself when and how many groups of elements must be included in the solution of any problem. Redistribution of the functions of the elements is achieved as a result of the action of many positive feedbacks, which seek the best --the optimum -- structure of tye system until they find it. Realization of the idea of the construction of reliable systems which consist of comparatively unreliable elements is closely tied with the characteristics of feedback.

In open, series-connected systems of control where there is no feedback, the following law exists: the more elements in the system, the higher the reliability demanded of each in a system of the same reliability.

This law does not apply in feedback systems. With an increase in the number of elements the system, there is no increase in the reliability demanded of each.

The creation of reliable systems from unreliable elements is in principle allied to the utilization of feedback, and no simple duplication of elements in open chains of control can compare with the effect of the universal stability of feedback systems.

It is obvious that similar cybernetic systems used for the control of cosmic ships will allow not only the lowering of the weight of the apparatus, but also the attainment of the absolute reliability and durability of all of its mechanisms.

21. Improving the Efficiency of Automatic Systems Operators

"The Automation of the Masters of the Automatic Machines"; Alma-Ata, Kazakhstanskava Pravda, 20 Sep 62, p 4

This article deals with research to determine what construction of the control panels of automatic machines will result in the greatest efficiency of the human operator.

One problem concerns the "operating capacity" (propusknaya sposobnost') of the controller. Here the engineer proceeds from the physiological capabilities of the human organism. It was found that man is capable of perceiving and remembering only five to nine bits of information at any one time. Consequently, the engineers distributed the information over a certain period so that instead of all the information coming to the operator at once, it comes in turn, in order of importance. In this way, nothing is missed, lost, or forgotten by the operator. The numbers that determine the interrelationship of technology and physiology and 80 bits of information per hour under normal conditions, up to 140/hour under stress and more than 140/hour under very severe conditions. Of course, the author adds, this relation is by no means settled by such numbers.

Another problem mentioned in the article is the arrangement of the buttons and levers on the control panel so that no unnecessary effort is demanded of the controller. Research here has to do with the physiological changes that occur in man during physical labor. It has long been known that during physical labor sugar is fed via the blood from the liver to the muscles. In this way, the power consumption is compensated for. Study has shown that the automatic self-regulation of the organism is inherent in. The processes of control.

Research at the Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences, has demonstrated the following blood-sugar levels for various occupations: for people working at the control panel of a television center, 1.6 times greater than the norm; for dispatchers at Vnukovskiy airport, 1.5 times greater; and for subway dispatchers, 1.4 times greater. At peak hours, the blood-sugar level of the airport dispatcher was as high as 21% of the norm.

The author concludes that this valuable research will permit the selection of optimum work conditions for the controllers of automatic systems, conditions under which the norms of safety of the automation within the human organism will not be exceeded.

22. V. Glushkov Discusses Various Applications of Cybernetics

"Problems of Cybernetics," by V. Glushkov, Vice-President, Academy of Sciences Ukranian SSR; Kiev, Rabochava Gazeta, 21 and 23 Oct 62, p 2

This is a two-part article discussing cybernetics, both in general and with reference to its application in particular areas of the national economy. The first part is primarily an introduction to the subject.

Turning to the application of cybernetics, the author cites, first, the automation of complex engineering-technological and scientific calculations. Another very important area for the application of cybernetics is the planning of the national economy and practical economic control. The problem of the control of production consists of the establishment of communication between the human producers and the shops and factories. As the quantity of units of equipment and the people working on them grows, the interrelations between them and the system of control increase, and the stream of information increases more than production itself. The fact is, the author continues, that the contemporary level of mechanization and automation of work in the sphere of planning, control, and calculation is considerably below the level of automation of work in the sphere of material production. The level of technical equipment in industrial planning has changed little since the 1930s.

Concrete calculation has shown that the improvement of control and planning cannot come from an increase in control apparatus or an increase in the quantity of calculations and calculating machines with which our economists and planners are equipped.

One very widespread problem the author notes, is that factories are constantly lacking the supplies necessary for the manufacturing of their products. Somehow, they manage to get what they need, in the end, but this method had not been worked out earlier.

At the moment, there are no automatic machines which can reliably read the request forms and feed them into an electronic machine. Hence the problem here is to re-do the whole existing system of demands -- the collection, storing, and calculation of such documents -- to adapt it to the machine by putting all of this documentation on perforated cards and magnetic tape. In addition, it is necessary to re-form the psychology of the people involved -- economists, planners, directors.

It is obvious that for the rapid exchange of information between the central organ and the localities, there must be modern lines of communication among the machines. In such a fashion, a united state system for the processing of planned economic information and the control of the economy will be created. All operative information will come into this system from the

national economy and will be processed. This will make it possible to find the optimal versions of planning, to eliminate temporary disproportions, and to introduce corrections into material-technical supplies, all in a very short time.

This work has already begun and is proceeding very quickly. The Institute of Cybernetics, Academy of Sciences Ukrainian SSR, has done a great deal of work on the planning of transportation. At the present time, this institute, in cooperation with Gosplan Ukrainian SSR, is working on the automation of one of the worst spots in our economy -- material-technical supplies.

Another very important area of intellectual activity that is subject to automation with the help of computers, the author continues, is engineering-construction work and technical projecting. For example, before a road is built or electric lines are put up, the planners consider dozens of plans and choose the best. But if more plans had been considered, perhaps an even better one could have been found. For more qualitative projection, as well as for complete automation in this area, methods of machine evaluation and machine analysis of the variants must be worked out.

In the Institute of Cybernetics [of which Glushkov is Director], much work on machine projection has been done, in the areas of profiles of railroads and electrical, gas, and water-supply networks and also on the complex automation of the processes of the projection and manufacture of ship-frame components.

Speaking of the future application of computers to the automation of intellectual activity, the author cites the area of scientific creation. Machines are already being used here for the automation of such auxiliary work as calculations and computations, searching for literature on a given subject, translating, and reviewing scientific articles.

One aspect of scientific work which could well be done by machine is the receipt and processing of experimental data with the verification of advancement of hypotheses, the construction of theoretical projects on the basis of experiments, and the proof of theorems in the framework of various deductive theories.

Our institute, the author adds, is also doing work in this field. This work involves the automation of bibliographic searches and the recognition of the purport of sentences in the Russian language, the proof of some, though as yet simple, theorems, and the modeling of machine self-learning and self-perfecting systems.

In addition, we have invented a machine -- "automat-director" -- that, to some extent, replaces a number of the functions of the director. For instance, all information as to what personnel and materiel are available at any given time can be programmed into the machine, and from that the machine can plan the various projects which are undertaken by the institute.

23. Berg Speaks on Cybernetics in Medicine and Biology

"Cybernetics and Progress," by Academician A. Berg; Moscow, Uchitel'skaya Gazeta, 20 Oct 62, p 3

In this article, A. Berg gives a general resume' of the history of cybernetics. He cautions that after studying the advances that have been made in this field over the past 15 years, one must, nevertheless, be "modest and careful in conclusion." He continues: "I do not share the point of view about 'thinking' machines. Electronic machines cannot think and never will think. Only combinations of living nerve cells, making up the human brain, can think."

Berg stresses several times the importance of cybernetics for further progress in biology and medicine. As an example, he cites the concept of optimality, which, along with the concept of information, is basic to cybernetics. "The concept of optimality should be of special interest to the biologists, since one has to know to what extent the human organism works in optimal conditions. In the process of evolutionary development, man developed in his organism a multitude of optimal processes.... But this optimal process lasts only a few dozen years and always ends with death. Besides, there are many processes in the organism which are always far from perfection and are often harmful."

24. Role of Conscience in the Communist Society of the Future

"The Marxist-Leninist Ethics on Conscience -- Conversations on the forming of the New Soviet Man," by L. B. Volchenko; Moscow, Voprosy Filosofii, No 2, Feb 62, pp 134-144

In the conditions of the creation of communist social relations, the role of personal initiative, self-control, and the conscious responsibility of each person for his conduct is constantly increasing. "In the process of transition to communism," states the Program of the Communist Party of the Soviet Union, "the role of moral principles in the life of society grows, the sphere of action of the moral factor expands, and the significance of administrative regulation of the relations among people correspondingly decreases." To train a person's conscience, to fight for its cleanliness -- without this, both voluntary adherence to the norms of social morality and the gradual transition from various forms of administrative control to the social regulation of human relations are unthinkable.

Having thus introduced his subject, the author proceeds to discuss, first, the writings of Marx and Engels on conscience and then the role that conscience will play in the new society.

Marx and Engels understood conscience as follows: Conscience is formed in man together with his consciousness and his convictions; it expresses his relations to the surrounding reality. A man is not born with a ready-made ability to evaluate his acts from the standpoint of their social significance. Conscience is formed in the course of a man's entire life; its character depends on the conditions in which he lives, on the education that he receives. A man's connection with a definite class, his participation in the struggle of social forces, his position in society, and finally, the character of the society itself -- all these are determining factors in the question of the formation of conscience.

The author states that while in a bourgeois society one cannot be true to his conscience without being in conflict with prevailing public opinion, things are differenc under socialism. Under socialism, there are no social impediments for the concurrence of conscience with pulbic opinion, for public opinion here expresses the interests of the whole nation and condemns all who contradict it. If a person has thoroughly assimilated communist ethics, any act contrary to the interests of society will provoke in him dissatisfaction with himself and pangs of conscience. This dissatisfaction can at times exert an even stronger influence on a person than direct condemnation by public opinion.

The author notes that even now the communist relation to work experienced by many workers gives them the opportunity to work without a controller, bypassing the department of technical control. To the best of these workers, the factories and plants entrust a personal stamp which signifies full individual responsibility for the quality of goods turned out. A locksmith at a Moscow factory declared that it was just this high confidence that obliged him to work outstandingly. Workers at the same factory ("Manometr") told visitors from the Institute of Philosophy, Academy of Sciences USSR, that the production of goods of excellent quality was their organic need, that their professional conscience did not allow them to tolerate defects in their work.

The fact that some relations previously regulated by laws are controlled more and more by public opinion on the basis of moral norms is also encountered. This is connected with the growing role of social organizations (comrades' courts, social control, new efficient forms of wall placards, and others) and with the increase of consciousness of the Soviet man, not only in production relations, but also in life. Buffets and stores without salespeople, transportation without conductors, the distribution of earnings without cashiers at many factories -- all of this is evidence of the fact that communist ethics are being inclucated more and more into daily life, that the Soviet state can rely on the conscience of the people to an increasingly greater degree.

Emphasizing the huge role of the communist training of the Soviet people in the general business of the building of communism, the party includes in its moral code such moral principles as a high consciousness of social duty, impatience with the infringement of social interests, comradely mutual aid, humane relations and mutual respect among people, honesty and truthfulness, moral cleanliness, impatience with injustice, parasitism, dishonesty, careerism, etc.

In the communist society, all of the conditions will be created for the basic principles of communist ethics to become the moral qualities of each person. The voluntary (according to conviction) adherence to these moral principles and norms will become the business of the conscience of man in the communist society. Conscience will become one of the basic regulators of the moral life of the society.

The author concludes by saying that communist training will gain all the more success in reltaion to the improvement of working and living conditions of the Soviet people, the growth of their general culture, the still more active attraction of the best people of the society to the education of the young generation, and the increasing influence of public opinion in all spheres of human relations.

25. Cybernetics Gives New Instruments to Physiology

"Signals From Radio-Pills," by Evgeniy Babskiy, Academician of the Academy of Sciences Ukrainian SSR; Alma-Ata, Kazakhstanskaya Pravda, 30 Oct 62, p 3

This article discusses the possibilities that cybernetics makes available to physiology. At a recent session of scientists of the Biological Department of the Academy of Sciences USSR, Babskiy delivered a report on new methods of physiological research and medical diagnosis.

Babskiy mentions several areas in which cybernetics has contributed to physiological research. One of these is the creation of telemetering systems, which makes possible physiological research and the control of physiological processes at a distance. A basic telemetering system is the miniature radio transmitter which is fastened to a man's body and then relays data to a control point. Such an instrument was used for observation of cosmonauts.

New methods of research and treatment have been developed -- for example, electrical stimulation, electrocardiograph, and blood-pressure measurement. The application of electronics and automation has also led to new possibilities in the collection and processing of information about the condition of the organism or of separate organs. One example in this area is the "radio-pill." This is a small tube less than 2 centimeters in length and several millimeters in diameter, with a transistorized radio transmitter with batteries and special transducers inside. This moves along the gastrointestinal tract and relays information about acidity, pressure, or temperature. Experimental forms of the "radio-pills" have already been tested at the Institute of Physiology, Academy of Medical Sciences.

There are two widespread heart diseases -- mitral stenosis, stenosis of the opening of the heart valve, and mitral insufficiency, a defect in the valve itself -- which are very similar. The first of these diseases can be successfully treated by surgery; however, for a long time there was no effective way to distinguish between the two. This can now be done by measuring the blood pressure in the auricle and determining its speed and dependence on time.

It is hard to imagine a physiology laboratory, the author concludes, without such apparatus as an oscillograph, amplifier, computing equipment, various types of transducers, and pulse generators.

26. "Biochemical Cybernetics" Defined

"What Is Biochemical Cybernetics?"; Moscow, Moskovskaya Pravda 5 Aug 62, p 4

In this article, Prof Anatoliy Germanovich Pasynskiy, Doctor of Chemical Sciences, director of the laboratories of the Institute of Biochemistry, Academy of Sciences USSR, defines biochemical cybernetics.

Cybernetics has not yet sufficiently mastered the processes of metabolism he begins. The chemical reactions of this exchange are studied in biochemistry; biochemical cybernetics investigates the control of these reactions, as well as the biochemical mechanisms of the transmission and conduction of information in the living organism.

The application of cybernetic methods to the modeling of the processes which occur in the central nervous system and the sense organs has already led to a number of prominent achievements. But in this research, the intermediate biochemical processes still have not been taken into account. Now the problem is to master the complex totality of the 100 chemical transformations which take place in the organism, to be able to calculate the course of these transformations.

Pasynskiy notes that sometimes people think that if protein substances are used in a cybernetic machine, it will be possible to approximate the machine's structure to the structure of biological systems, i.e., living organisms. This is not altogether so. The work of all contemporary cybernetic machines is based on the physical processes of the motion of electrons in various metals, plastics, and semiconductors. Protein cannot replace these materials. Its activity in the organism is based on chemical reactions and diffusion molecular processes, which are completely absent from the structure of cybernetic machines.

He concludes by saying that in principle, of course, it is possible to construct a self-reproducing system based on chemical transformations and diffusion trnasferences in protein bodies. But that would not be simply a better type of cybernetic machine. It would be the solution to a much more grandiose problem -- the synthesis of living matter.

IV. MEDICINE

Aerospace Medicine

27. Space Travel and Weightlessness Ruled No Hindrance to Intake of Natural Food Products

"The Food of 'Gods': How Andriyan Nikolayev and Pavel Popovich Are Being Fed," by Candidate of Medical Sciences G. A. Arutyunov; Kiev, Pravda Ukrainy, 15 Aug 62, p 3

G. A. Arutyunov reports that the food consumed by spacemen Andriyan Nikolayev and Pavel Popovich aboard their spaceships can be truly called "the food of gods." Both spacemen consumed breakfast, lunch, and dinner while flying in orbit through space. Their diet was more varied than that of either Yuriy Gagarin or German Titov. The menu of Nikolayev and Popovich consisted of meat croquettes, fried veal, filleted chicken, various kinds of sandwiches, pastry (pirozhki), cake, fruit, and hard candy. Nikolayev and Popovich also had with them an assortment of liquids: water, coffee, and different fruit juices.

Prior to the flights of Gagarin and Titov, it was not clear how spacemen would be able to chew and swallow ordinary food. How natural food would move along the digestive tract of people traveling through space and in a state of weightlessness was also not know. After Gagarin and Titov completed their assignment, scientists were convinced that weightlessness and travel through space do not interfere with chewing, swallowing, and digestion.

Arutyunov further stated that Soviet scientists attempted to make the intake of food by Nikolayev and Popovich easy. Each food product was prepared for them in the form of small pieces or slices which could easily be placed in the mouth. Each spaceman was supplied also with vitamins B, C, P, E, and others.

Spacemen require food which will meet the requirements of an organism subjected to physical exertion and nervous and mental stress connected with the unusual conditions encountered at high altitudes during orbital flights. Physical functions of an organism in general and those functions which bring about its adaptation to unusual environments in particular require appropriate changes in metabolic processes. A specific qualitative composition of the food consumed by spacemen which will contribute to normal metabolism is, therefore, important. Soviet scientists are of the opinion that in case of physical stress, it is necessary to give as much attention to constructive metabolism as to increased energy expenditure. They think that it is expedient, under such conditions, to utilize amino acids which are essential in human nutrition.

The experience of cosmonauts Nikolayev and Popovich will contribute greatly to space medicine as far as nutrition and weightlessness are concerned. The new data accumulated will be utilized by scientists in flights of longer duration. G. A. Arutyunov emphasized, however, that flights of long duration would require research on problems involving the development of closed ecologies within the space vehicle itself.

28. Scientific Session on Aeromedical Aspects of Deep Space Exploration

"Life and the Cosmos. A Scientific Session in the Academy of Sciences USSR"; Tallin, Sovetskaya Estoniya, 3 Oct 62, p 1

"Moscow, 1 October (Tass). No other event of great significance in science and technology produced such a profound reaction and exerted such a strong effect as did the successful launching of the first artificial earth satellite. This observation was made by Academician N. M. Sisakyan at a session of the Department of Biological Sciences of the Academy of Sciences USSR.

Discussing the principal steps taken in the conquest of outer space, N. M. Sisakyan remarked that flight safety was the leading principle of the experimental research conducted. This explains the extensive program of vehicle launchings with animals aboard and the development of methods of continuous medical supervision. The desire to provide maximum safety for cosmonauts was the basic aim of scientists and engineers when they were designing rescue devices and were studying the possibility of accurately predicting cosmic radiation.

"The first report was that of O. G. Gazenko and V. I. Yazdovskiy; it was read by Doctor of Biological Sciences O. G. Gazenko and gave evidence of a truly titanic effort of ciologists, physiologists, and physicians to formulate a science dealing with life in outer space. It was a story of how information in aerospace biology and medicine was accumulated and how early experiemnts with animals on rockets and on artificial earth satellites were conducted. The report contained also a great number of generalizations concerning the vital activity of a human organism under conditions existing in outer space. The scientist described in some detail the flight of cosmonauts Andriyan Nikolayev and Pavel Popovich.

"Both cosmonauts maintained a high level of self control even at the countdown: they showed no symptioms of depression or anxiety. As is known, introspection and detailed recording of experiences were part of the routine that the cosmonauts had to follow. Physicians noted that both cosmonauts carried out their special psychological and vestibular tasks in an excellent manner. It required no more time than on earth to solve numerical problems (oral addition): each made one mistake. A. Nikolayev and P. Popovich

also tried to determine their position in space with their eyes closed when their vehicle was in a state of 'free float.' Notations entered in logbooks showed that it was not possible.

"O. G. Gazenko also discussed some results of clinicophysiological examinations of the cosmonauts made after their return to earth. No pathological changes whatever were observed in either of them. Physicians noted only slight symptoms of fatigue.

"the scientific session will last 2 days. Scientists will discuss various questions in aerospace biology and medicine. Some of the questions to be taken up are the basis for the development of an artificial environment in cabins of space vehicles, protection against radiation, and special methods of training cosmonauts."

29. Importance of Counterpressure Garment in Alleviating Adverse Effects of High Intrapulmonary Pressure in Dogs

"The Effect of Compensation for Excessive Intrapulmonary Pressure on Oxygen Tension in Cerebral Tissue During Ascents to High Altitudes," by Ye. A. Kovalenko and F. V. Babchinskiy (Moscow); Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, Vol 48, No 10, Oct 62, pp 1203-1208

This report describes experiments conducted on ten dogs undergoing simulated ascent to altitudes of 15, 17, and 20 kilometers during which excessive oxygen pressure of 800, 1,100, and 1,400 mm Hg was maintained. The aim of these experiments was twofold: onw was to determine the rate at which an animal organism must be supplied with oxygen on the basis of the level of its tension in the cerebral tissue; the other was to clarify the relationship between oxygen delivered under excessive pressure and the quality of compensating counterpressure on the body provided by a high-altitude survival suit.

Results of the experiments showed that the level of hypoxia of the brain is closely connected with the mechanism of pathological action during ascents to high altitudes when a compensating intrapulmonary pressure is absent or is inadequate. Reflex disturbances in cardiac activity and in respiration are also involved in the mechanism of pathological action.

Platinum electrodes were implanted into the cerebral cortex and the subcortex of the ten experimental dogs. A polarographic apparatus was used for determining oxygen pressure in the cerebral tissue of the animals in an altitude chamber. With the aid of this apparatus, it was possible to record oxygen pressure simultaneously at two points of the brains of the dogs.

30. Protection Against Radiation in Outer Space Discussed

"A Dependable Shield," by Gen Med Serv Yu. Volynkin and Doctor of Medical Sciences P. Saksonov; Moscow, Sovetskaya Rossiya, 21 Aug 62, p 3

Soviet space scientists are trying to devise a screen for space crews to shield them against radiation during long space flights. The efforts of many scientists have directed toward a search for effective chemicals capable of protecting a living organism against lethal doses of penetrating radiation. A shield made of metal would increase the weight of a space vehicle.

A study of the biological effects of cosmic radiation was undertaken comparatively recently. This study is being conducted under laboratory conditions and by experiments on various objects present in vehicles flying at altitudes of 180-450 kilometers for periods of 1 1/2-25 hours and returned to earth for examination. Such experiments have been establishing a base for the further conquest of space by man.

Ionizing radiation on earth affects the human organism differently than in outer space. Outer space is pierced with radiation which is made of diverse elements. The energy of this radiation is very high, and it acts on the organism without interruption in combination with G forces, vibration, noise, and weightlessness. All of this cannot be reproduced very well under laboratory conditions.

Results of many experiments showed that brief flights of space vehicles in orbit below the radiation belts of the earth, where intensive solar flashes are absent, present no danger to space travelers. Some of the biological objects aboard the space vehicles "Vostok-1" and "Vostok-2" made it possible to learn how ionizing radiations affect different organisms (fruit flies, lysogenic bacteria, onion, and wheat.

The discovery and utilization of chemicals to protect a living organism against lethal doses of penetrating radiation is desirable. Metal shields against radiation would only add weight to space vehicles and increase flight time.

31. Czechoslovak Comments Regarding International Astronautics Conference

"Science and the Universe: When Will Man Land on the Moon?"; Bratislava, Slobode, 14 Oct 62, p 6

The 13th Congress of the International Astronautics Federation held in Zlate Piesky [date not indicated] was attended by 350 scientists from throughout the world. The delegation from the Astronautics Commission of the Czechoslovak Academy of Sciences was composed of R. Pesek, corresponding member of the Czechoslovak Academy of Sciences, V. Guth, corresponding member of the Slovak Academy of Sciences, and Dr V. Kopal.

In reporting on the discussions of the congress, Dr Pesek stated, among other things, that he believes that man may land on the moon between 1965 and 1970. While the US plans such attempt for 1967, the USSR is about 2 years ahead in its astronautics. The attempts will involve the rendezvous technique. Several methods are possible. Basically, the technique will involve two space units, one containing the astronauts and the other fuel, particularly for the return trip. These units are to rendezvous in space, either in orbit around the earth, en route to the moon, or in orbit around the moon. Eventually they are to rendezvous directly on the moon. In rendezvous in orbit around the moon, the mother ship with one member of the crew would remain in orbit and other astronauts would be launched in a special capsule to make the actual landing on the moon. The congress also considered problems of the actual landing on the moon's surface, e.g., the problem of visibility since there may be a layer of dust on the moon caused by air stream from the rocket engines.

Dr Pesek discussed the contributions of Czechoslovak science to astronautics. He pointed out that the International Astronautics Federation has two specialized organs: the International Astronautics Academy and the International Institute for Cosmic Law. Czechoslovakia has leading functions in each of these organs. Dr Kopal is a member of the Executive Committee of the International Institute for Cosmic Law, while Dr Pesek is chairman of the Technical Section of the International Astronautics Academy. Czechoslovakia has made numerous contributions, particularly in solving problems of space mechanics, solar research, etc. Problems of space medicine are being successfully dealt with in Czechoslovakia, and efforts are being devoted to problems of space law. Czechoslovak observatories are following flights of artificial satellites.

Diagnosis

32. New Diagnostic Machines

"A 'Combine' Conducts Diagnosis," by Physician V. Nikolayev; Moscow, Moskovskaya Pravda, 27 Sep 62, p 3

A five-channel cardiological complex which is used to diagnose cardiovascular diseases is described. This unique diagnostic "combine" operates quickly and accurately. It has been installed in the laboratory of clinical physiology, Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR.

A three-channel phonocardiograph for detecting the slightest noises in the heart and an electromanometer used to determine the severity of any cardiovascular disease present are mentioned.

The ballistodynamocardiograph is another apparatus which records the mechanical function of the heart and signals promptly any changes in the valves or in the pericardium. This apparatus can indicate the effectiveness of the therapy prescribed or the surgery performed on the heart.

The five-channel cardiological complex was developed by the Design Bureau of "Biofizpribor" in cooperation with the laboratory of clinical physiology, Institute of Normal and Pathological Physiology, Academy of Medical sciences USSR. Academician Ye. B. Babskiy, a member of the Academy of Sciences Ukrainian SSR, is director of the laboratory.

"An Apparatus Examines a Patient"; Leningradskaya Pravda, 24 Jun 62, p 2

"An original apparatus, the 'physiograph,' was invented at the Krasnogvardeyets plant. It can record six types of physiological processes simultaneously; it can take down cardiograms and phonograms of cardiac murmurs, measure blood pressure, temperature, and pulse, and record oxygen saturation of the blood. All readings are recorded on a paper tape. A physician can observe changes in any one of the processes.

"Rapid reception of objective information about a patient's condition offers the possibility for rapid diagnosis.

"Semiconductors are widely used in the apparatus. The plant has released the first batch of new apparatuses for use in Leningrad clinics."

33. New Tick-Borne Encephalitis Diagnosticum

"Briefly About Different Things"; Moscow, Moskovskaya Pravda, 8 Aug 62, p 3

"A new preparation for diagnosing tick-borne encephalitis has been developed by a young scientist, A. A. Stetkevich, at Tomsk Institute of Vaccines and Sera under the direction of Prof S. P. Karpov, corresponding member of the Academy of Medical Sciences USSR. The preparation is given to a patient with symptoms of encephalitis, and within one day the physician establishes a precise diagnosis of the disease. Now Tomsk Institute of Vaccines and Sera is beginning industrial production of the new preparation."

Epidemiology

34. Migratory Bird Parasites Studied

"Ixodes Ticks of Birds of the Belorussian SSR," by B. P. Savitskiy, Ekol. i Migratsii Ptits Pribaltiki (The Ecology and Migration of Baltic Birds), Riga, Academy of Sciences Latvian SSR, 1961, pp 107-113 (from Referativnyy Zhurnal -- Biologiya, No 19, Oct 62, Abstract No 19K55, by N. Filippova)

"Among Ixodes ticks in the Belorussian SSR, the most widely distributed parasite of birds is Ixodes ricinus, which was noted on 24 species of birds. This species most frequently parasitizes birds in its larva and nymph phases. The curve of the numerical values of these phases has a single-peak nature; its peak occurs during the period when the nestlings are being raised--June and July. Two ecological types of birds, those which take their food from the ground and those which nest in low levels of woods, serve as the principal hosts for the ticks. In addition to the species mentioned, the author reported single occurences of four others."

35. Study of Encephalitis in Leninogorsk

"Characteristics of Microbiological Findings in a Study of the Encephalitis Incidence in Leninogorsk," by Zh. K. Katarbayeva, A. A. Kalantayevskaya, Z. M. Tungachina, and V. P. Kovalenko, Tr. Kazakhst. In-t Epidemiol., Mikrobiol, i Gigiyeny (Works of the Kazakh Institute of Epidemiology, and Hygiene), No 4, 1961, pp 342-344 (from Referativnyy Zhurnal -- Biologiya, No 18, Sep 62, Abstract No 18B282, by Ye. Saakyants)

"An increased incidence of angina and catarrhs of the upper respiratory tract was noted during an outbreak of encephalitis in Leninogorsk. The authors examined material from the throats of patients with different forms

of encephalitis and patients suffering from angina and catarrhs of the upper respiratory tract. A total of 582 persons, 319 of whom had different forms of encephalitis and 263 of whom had angina and catarrhs, were observed. Some 851 strains were isolated from all the patients examined. Streptococci predominated (75.5%), a lower number of Staphylococci (14.5%), diphtheria bacilli, capsular diplococci, and other microorganisms (10.0%). The species composition of the microorganisms isolated from encephalitis patients and persons contacted by them was not found to have any special features; however, pathogenic strains of Streptococci were observed most frequently in encephalitis patients."

36. Czechoslovak Epidemiological Situation

"Report on the Development of the Epidemiological Situation in Czechoslovakia in August 1962," by A. Kazmar, MD, and J. Roudny, Doctor of Natural Sciences; Prague, Casopis Lekaru Ceskych, Vol 101, No 45, 9 Nov 62, p 1360

The monthly report on the incidence of various diseases among humans in Czechoslovakia includes data on the number of cases of the following diseases reported during August: brucellosis, 15 cases; ornithosis, 24 cases; and Q fever, 31 cases.

37. Foot-and-Mouth Disease Prevalent in All of Bezirk Magdeburg -- Great Supply Difficulties in Infected Areas"; West Berlin, Informationsbuero West, 2 Nov 62, p 3

Foot-and-mouth disease has spread rapidly in Bezirk Magdeburg during the past several weeks. According to the Epidemic Prevention Commission, only one of 20 Kreise, i.e., Kreis Wernigerode, has not been affected by the epidemic. Even the Magdeburg City district has been affected and city authorities have been forced to close the local zoo.

An official appeal urging the Bezirk population to adhere strictly to public combative and preventive measures states that "the epidemic will result in serious consequences for the entire economy."

The epidemic in Bezirk Magdeburg has primarily affected swine because, according to the Epidemic Prevention Commission, "there is as yet no effective vaccine for pigs anywhere in the world." Losses are particularly heavy among suckling pigs. Since the epidemic can be spread the consumption of meat from contaminated animals and through loading and transporting of the animals, the Magdeburg Bezirk Council has ordered a drastic curtailment of slaughtering in the restricted areas.

38. Measures Taken Against Foot-and-Mouth Disease in East German District

"Protective Measures Against Foot-and-Mouth Disease in Bezirk Erfurt Intensified"; West Berlin, Informationsbuero West, 24 Oct 62, p 5

The situation in numerous Kreise in Bezirk Erfurt, where an outbreak of foot-and-mouth disease occurred several weeks ago, has become critical. Since previous measures taken by veterinary-medical authorities have been ineffective thus far, extensive new measures have now been enforced which will considerably restrict public activities.

Restricted areas may be entered only by persons responsible for the maintenance of the supply system and public order and safety. Persons holding important positions in the economy and in industry and workers who are essential in industrial production may leave the restricted zone, but they must reside outside the area until the restrictions are removed. Enterprises have been requested to obtain housing for these workers and, if necessary, to house them in schools or similar installations.

Persons residing in the restricted zone may not attend performances in Weimar. Also, individuals working in agricultural enterprises who take care of cattle may not attend public meetings or performances in the area. The Eisenach City authorities have ordered that all cattle be vaccinated against foot-and-mouth disease.

E S P

39. Book Discusses Possibility of Transmission of Mental Information at a Distance

Biologicheskaya Radiosvyaz' (Biological Radio Communication), by Bernard Bernardovich Kazhinskiy, Publishing House of the Academy of Sciences Ukrainain SSR; Kiev, 1962, 169 pp

This book deals with the possibility of the transmission of signals at a distance by living organisms without the participation of the organs of speech, sight, or smell; that is, so-called telepathy, mental information (according to B. B. Kazhinskiy), or simply, the transmission of thought over a distance.

In a rather lengthy introduction, V. A. Kozak (Candidate of Medical Sciences) discusses this thesis and Kazhinskiy's treatment of it, and cites evidence both pro and con. According to Kozak, Kazhinskiy in this book proposes the theory of electromagneitc processes to explain the transmission of mental information and describes and treats all phenomena

from this point of view. Kozak disagrees with Kazhinskiy's conclusion; he finds it diffcult to imagine that an electromagnetic field is the material substratum, the carrier, of "telepathy."

Kozak acknowledges the presence of electrical processes in human cells and organs, processes which flow with a definite periodicity. Further, these most probably developed in the organism as a result of evolution. However, these radio signals have a low intensity, and Kozak thinks it doubtful that they could transmit mental information. But here he cites experiments done in the US in which "telepathy" was successfully transmitted between two people, with the transmitter in an underwater boat that was completely encased in steel.

The weakness of these signals, Kozak continues, caused V. Arkad'yev to question whether they were even capable of leaving the confines of the skull. There is the additional problem of interference from atmospheric hindrances which are stronger than the signals. In radio technology, however, there are filters which free the useful signal from the interfering ones. These filters have proved especially effective in the area of ultrashort waves, which are the type that many scientists feel operate in the brain. It is possible that such filters could have evolved in the living organism over time. However, there is the additional problem of the short range of ultrashort waves.

It is also important to remember, Kozak points out, that the two people involved in this communication may have had the same experiences, so that the receiver might be repeating (mentally) the very thing sent. One problem is that instruments capable of registering the phenomena of this type of communication do not yet exist; this makes confirmation of actual communication, as well as information on what factors aid and inhibit transmission, difficult to acquire.

In all probability, he continues, mental information appeared in an early stage of the development of the animal world and now, especially in man, is becoming extinct due to the appearance of more effective forms of communication. That is, this type of communication dies out in relation to the development of the cerebral cortex and the general evolution of the animal world, and is supplanted by other distant organs of feeling. (Hence, its presence in man at present is, in all probability, an anachronism.)

Support for this hypothesis may possibly come from the fact that during a decrease in the inhibiting function of the cerebral cortex in psychically ill persons and also in persons under hypnosis, there is an increase in the transmission of information. In addition, one of the more widespread indications of psychic disturbance in mentally ill persons is their feeling that someone is trying to influence them and is suggesting thoughts to them. Perhaps the explanation is that under conditions of a decrease in the function of the cerebral cortex, the old possibilities of transmitting mental information no longer controlled by the higher sections of the brain "awaken," and the sick person begins to receive signals which in a healthy individual are filtered out by the cortex.

Such communication can also be experienced by people in disastrous situations, when the separate functions in the lower sections of the brain can escape from the control of the corresponding sections of the cerebral cortex.

The fact that so far no distinct phrase has been transmitted suggests that the phenomenon of biocommunication was "inherited" from animals, to whom concepts of logically connected words and phrases are foreign. The information probably proceeds mainly on the level of the first signal system, or the level of such sensations as fear and the feeling of danger.

In introducing Kazhinskiy, Kozak describes him as an engineer-electrician, candidate of the physical-mathematical sciences, and a pioneer in research on this problem in the Soviet Union.

Turning to the author's conclusion, we find that in Kazhinskiy's opinion, one of the most important results of the research that has already been done in this area is that the existence of nervous elements which are similar to the two capacitor plates or the windings of a solenoid has been established. The presence in the nervous system of oscillating bioelectric currents which function on the principle of action of the capacitor or the solenoid in the Thomson oscillating contour has been proved experimentally. The facts of the inductive influence of these currents within the organism have also been determined. The bases of the theory of the generation of bioelectromagnetic waves which radiate outward from the central nervous system during the act of thinking have been worked out.

Looking ahead to the possible uses of radio communication between people, Kazhinskiy foresees the possibility of the subsequent development of existing forms of pedagogics on a higher level. Methods of systematically organized bioradiative influence with the help of telepathy radiating from the brain of the teacher directly into the mind and psyche of the student ought to be adapted. For this it will be necessary to instruct teachers in the methods of mental suggestion in teacher preparatory courses. Physical instruments to help the teacher accomplish this mental transfer of information must be developed. Instruments are also needed which can measure the bioradiative wave of the parameters which correspond to the act of thinking.

Kazhinskiy predicts that relatively soon, biology will become the leading science and the originator of the new and most important areas of technology, a role now played by physics. He foresees the development of many new apparatuses as a result of work in the field of biological radio communication. Closely tied to the question of the development of very subtle instruments and conductors which possess superconductivity at temperatures close to zero is the idea, developed by Soviet scientists, of quantitative radio technology -- so-called molecular oscillators which give highly stabilized electrical oscillations in the course of lengthy

use. Another important achievement is the creation of molecular amplifiers which greatly increase the sensitivity of apparatus and decrease the noises which earlier had distorted reception and reduced the distance of action of radio communication devices. The possibility is not excluded of the adaptation of the idea of molecular generators and amplifiers to the study of the nature of the highly subtle physical phenomena which accompany the work of the brain in the processes of thinking and of the transmission and reception of telepathy at a distance.

Kazhinskiy concludes by predicting that the complete understanding of the laws of the thinking process will help solve the greatest secret of living matter, its ability to think, and will increase the power of reason over the blind forces of nature.

Gerontology

40. Various Lines of Research in Endocrinology

"Reporting," by G. Polishchuk; Kiev, Pravda Urkrainy, 20 Jun 62, p 3

This article describes the work of the Khar'kov Institute of Experimental Endocrinology, which is under the direction of Candidate of Medical Sciences Sergey Vasil'yevich Maksimov. The institute is studying the endocrine glands, their hormones, and the diseases connected with their malfunctioning.

There are many departments in the institute, each working on a separate problem. For example, the department of the endocrinology of aging, headed by Maksimov, is studying aging and the role of the endocrine glands. The scientists are attempting to learn, among other things, how the process of aging can be influenced and why the average life expectancy of men is less than that of women.

The department of pathological physiology, headed by Prof Semen Grigor'yevich Genes, is studying diabetes, which occurs as a result of the malfunctioning of the pancreas. Professor Genes is quoted as saying that the best treatment for this disease would be the replacement of the diseased gland by healthy one. However, this has not yet been achieved, although scientists have, after a long search, developed a preparation which can be taken in tablet form, in place of insulin shots.

The department of biochemistry, headed by Candidate of Medical Sciences V. Osinskaya, is studying the hormones secreted when the glands do not function correctly. "For instance, adrenalin, when oxidized, yields adrenochrome, which alleviates the fatigue of the heart muscle (it has been obtained by the chemists at the institute in a pure state). However, adrenochrome is dangerous in large quantities -- it can lead to mental disorders."

Among the medicines developed by the institute are a preparation for use against goiter (the first to be developed in the country) and preparations to be used against hypertension.

Gynecology

41. Chorion Implantation Into Vaginal Wall

"Two Cases of Chorion Implantation Into the Anterior Vaginal Wall," by V. Krawczyk and O. Mioduszewska; Ginekologia Polska, No 1, 1962, pp 71-77 (from Moscow Meditsinskiy Referativnyy Zhurnal, Akusherstvo i Ginekologiya, Section 10, No 9, Sep 62, Abstract No 1602, by S. B. Rafal'kes)

"Spontaneous miscarriage took place in both women. The implantation of the chorion into the vaginal wall was verified histologically. The implantation of the chorion was made possible via the vascular pathway although the authors suggest a contact mechanism for implantation following the exit of the fertilized egg through the vaginal canal."

Immunology

42. Ionizing Radiations and Anthrax Immunity

"Immunity to Anthrax During the Action of Ionizing Radiations on the Organism," by Ye. I. Silant'yev, V. A. Ankudinov, and S. G. Kolesov, Central Institute for the Advanced Training of Physicians and State Scientific Control Institute of Veterinary Preparations; Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, Vol 33, No 11, Nov 62, pp 121-123

Total irradiation of guinea pigs which causes a comparatively mild form of radiation sickness did not affect the formation of specific immunity against anthrax and did not change the resistance of the animals to this infection after inoculation if the interval between immunization and irradiation was not less than 9-10 days. The immunized animals which were affected by a zone of action of ionizing radiations which causes a mild degree of injury maintained specific immunity against anthrax. In nonimmunized animals irradiated by analogous doses, stable immunity against anthrax after inoculation with live STI vaccine developed 2-3 weeks after irradiation. A GUTCo-400 telegamma apparatus was used for irradiation. Each guinea pig received a dose of 170-180 r.

The animals were immunized subcutaneously with 0.2 ml of live STI anthrax vaccine, series No 18, prepared at Kaluzhskaya Biofabrika; it contained 30-33 million live spores per ml. Three guinea pigs which were immunized after irradiation died; none died in the group subjected to irradiation after immunication.

43. Effect of Ionizing Radiations on Antibody Formation

"The Antibody-Forming Function of the Organism Depending on the Route of Introduction of Antigen and the Sequence of Action of Ionizing Radiations," by E. D. Stepanyan, Sb. Tr. Sektor Radiobiol. AN ArmSSR (Collection of Works of the Sector of Radiobiology, Academy of Sciences Armenian SSR), No 1, 1960, pp 115-121 (from Referativnyy Zhurnal -- Biologiya, No 18, Sep 62, Abstract No 18R20, by R. Petrov)

"Rabbits were subjected to a 350 r dose of x-irradiation. They were immunized with a one ml (one billion microbial cells) dose of B. Breslau heated vaccine 4 days before or 4 days after irradiation. Antigen was introduced intravenously, subcutaneously, or intracutaneously once. The agglutinin titer was determined 4-21 days after immunization. The maximum agglutinin titer developed toward the 10th day. The aggultinin titer was 1:1,920 after intravenous immunization; it reached 1:2,560 following irradiation carried out after immunization, but decreased to 1:1,280 when irradiation took place before immunization. When antigen was introduced subcutaneously, the maximum agglutinin titer was 1:1,408, 1:1,280 when irradiation took place after immunization, and 1:576 when irradiation was done before vaccination. The maximun agglutinin titer was 1:896 when antigen was introduced intracutaneously. Irradiation stimulated antobody synthesis in both cases -- the agglutinin titer was 1:1,200 and 1:1,920."

44. Tenth Report in Series on Aerosol Immunization

"Aerosol Immunization With Dry Powdered Vaccines and Toxoids; Report 10: A Clinical Study of Postvaccinal Reactions to Aerosol Immunization With Powdered Brucellosis Vaccine," by N. I. Aleksandrov, N. Ye. Gefen, K. G. Gapochko, N. S. Garin, A. I. Maslov, and V. V. Mishchenko; Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, Vol 33, No 11, Nov 62, pp 31-37

Aerosol immunization of humans not sensitized to brucellosis with powdered brucellosis vaccine from strain 19-BA in optimum doses (280,000-820,000,000 live microorganisms) was found to be harmless and not very reactogenic. Aerosol immunization of persons sensitized to brucellosis was accompanied by frequent and pronounced postvaccinal reactions which, however, were harmless, brief, and completely reversible, and did not differ in nature from analogous reactions in persons with a negative immunological background.

A broader, more intensive study of the question of immunizing persons sensitized to brucellosis with brucellosis vaccine is

recommended to assist in solving the problem of the suitability of mass immunization of humans without preliminary knowledge of their immunological condition.

45. Intranasal and Aerogenic Flu Vaccination Methods Compared

"A Comparative Study of the Intranasal and Aerosol Methods of Vaccination Against Influenza," by V. M. Zhdanov, V. V. Ritova, N. Ye. Gefen, A. M. Zhukovskiy, M. L. Berlyant, N. A. Yevstigneyeva, N. B. Yegorova, L. S. Kreynin, S. L. Leonidova, V. M. Sergeyev, and M. S. Smirnov, Institute of Virology imeni Ivanovskiy, Academy of Medical Sciences USSR; Moscow, Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii, Vol 33, No 11, Nov 62, pp 63-67

The reactogenicity of influenza vaccines administered by the aerosol method was lower than that of influenza vaccines administered intranasally. No temperature reactions above 37.5° C were noted. Other symptoms of vaccine reactions (cold, headache, sneezing, etc.) were rarely observed and were not intense following use of the aerosol method. Type A_2 egg-tissue and egg-tissue combined vaccine provided the best indexes of immunological effectiveness. Comparative data demonstrated the suitability of the aerosol method for mass immunization of the population with live influenza vaccine, although further investigation is still required for final evaluation.

46. Immunization Against Anaerobic Infections

"A Study of the Immunological Effectiveness of Complex Immunization Against Gas Gangrene, Tetanus, and Botulism in Experiments on Monkeys," by S. A. Zelevinskaya, T. I. Bulatova, and I. A. Larina, Department of Wound Infections, (head, G. V. Vygodchikov, active member of the Academy of Medical Sciences USSR), Institute of Epidemiology and Microbiology imeni N. F. Gamaleya (director O. V. Baroyan), Academy of Medical Sciences USSR; Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, Vol 53, No 6, Jun 62, pp 59-62

"The problem of the effectiveness of complex immunization of man against anaerobic infections (gas gangrene, botulism, tetanus) has hardly been studied; therefore, immunization of animals which are closest to humans (monkeys) is of interest.

"In 1950, associates of the Anaerobe Department, Institute of Epidemiology and Microbiology imeni N. F. Gamaleya (S. A. Zelevinskaya and T.I. Bulatova) were the first in the USSR to perform experiments on

immunization of monkeys with tritoxoid (perfringens, oedematiens, and tetanus toxoids), and pentatoxoid (tritoxoid plus types A and B botulinum toxoids). The experiments were continued for 4 years (1950-1953) on 30 monkeys (marmosets, macacus rhesus, baboons) 3-5 years old and weighing 3,600-6,700 g.

"Several series of concentrated tritoxoid and pentatoxoid (nonadsorbed) in which the antitoxin-fixing capability of perfringens toxoid was 10-20 YeS, of oedematiens, 24-40 YeS, and of tetanus, 33 YeS, were prepared for immunization of the monkeys.

"In 1950, ten monkeys were immunized three times (1, 2, and 2 ml) with tritoxoid; revaccinated 9 months later with a tritoxoid dose of 1.7 ml; and were again revaccinated after 2 years with one ml of tritoxoid.

"After the third injection, the perfringens toxoid titer in one of the monkeys was >0.2 <0.5 AE, and in the others was < 0.05 AE; the oedematiens titer was 0.02-0.1 AE or <0.02 AE, and the tetanus titer was >0.1 AE.

"After revaccination in 1951, the perfringens antitoxin titer was 0.1-1.5 AE, oedematiens, 1-10 AE, tetanus, 1-3 AE. Before revaccination in 1953, the perfringens and oedematiens antitoxin titers were <0.1 AE, and after revaccination the perfringens antitoxin titer was 0.1-2 AE and oedematiens, 2-15 AE, i.e., the titers became the same as after the first revaccination in 1951.

"In 1951, 20 monkeys were immunized three times with pentatoxoid and also ditoxoid. This immunization did not produce a pronounced increase in the titers of types A and B botulinum antitoxins, and the perfringens and oedematiens antitoxin titers were the same as in the monkeys of the first group after the third inoculation

"In 1960, 9 years after immunization, the six monkeys which remained alive in the second group were inoculated with a one ml dose of pentatoxoid which contained 40 YeS of perfringens toxoid, 60 YeS of oedematiens, 250 YeS of tetanus toxoid, and 50 YeS each of types A and B botulinum toxoids. The toxoid was adsorbed on aluminum hydroxide.

"It must be noted that for a number of monkeys this inoculation was a revaccination with respect to five antigens, but in three monkeys revaccination took place only with respect to botulinum toxoids; primary immunization took place with respect to perfringens, oedematiens, and tetanus toxoids.

"The antitoxin titers were >0.1 AE before inoculation in all cases. Within 14 days after inoculation, the perfringens antitoxin titer was 0.1 AE in all monkeys, oedematiens was<0.1-3 AE in three revaccinated monkeys, and in three which had received oedematiens toxoid first, 0.1 AE or lower. The tetanus antitoxin titer in revaccinated monkeys was 2-5 AE, and was not determined in three others.

"It is interesting to note that the botulinum antitoxin titers in monkeys which had been immunized earlier only with botulinum toxoid and in monkeys which had been immunized earlier with pentatoxoid were generally uniform after revaccination in 1960.

"It was thus established in experiments on monkeys that perfringens toxoid in doses of 10-20 AE per ml introduced in complex preparations (tritoxoid and pentatoxoid) had weak immunizing properties even in triple immunization with subsequent revaccination.

"It was shown in the work of I. A. Larina and associates that in immunization of monkeys with tritoxoid containing 30 YeS in one ml and sorbed on aluminum hydroxide, the perfringens antitoxin titers were 0.2-2 AE after the second immunization.

"In this case, evidently, not only the high concentration and the better purification of the antigen play a role, but also its adsorption on aluminum hydroxide.

"In our investigation was more effective with respect to the formation of perfringens and oedematiens antitoxins if it was carried out 9 months or 2 years after primary immunization. Revaccination 9 years after primary immunization was not very effective from the standpoint of perfringens antitoxin formation.

Triple immunization of monkeys with pentatoxoid did not produce high titers of botulinum antitoxins; however, they remained traceable.

"Remote revaccination was found to be extremely effective with respect to types A and B botulinum antitoxin formation if carried out even 9 years after immunization."

(One table is included to show results of revaccination of six monkeys with pentatoxoid in 1960.)

Bibliography

Larina, I. A., Dzhikidze, E. K., and Aksenova, A. S., Byull. Iksper. Biol., No 9, 1961, p 88.

47. Plague Immunity Evaluated

"The Question of the Nature of Immunity Against Plague," by Ye. I. Korobkova and L. V. Samoylova, All-Union Scientific-Research Institute "Mikrob"; Moscow, Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii, Vol 33, No 11, Nov 62, pp 76-81

A study of the immunity which occurs after inoculation of live plague vaccine provided an experimental basis for a theory concerning the presence of a phase of nonsterile immunity which is replaced by sterile immunity after the vaccine microorganisms are eliminated from the organism. A characteristic of sterile immunity is its dependence on the duration and intensity of the nonsterile immunity phase (the vaccine process). Killed chemical vaccines of different types confer rapidly extingueshed, comparatively intense immunity. The immunogenicity of different P. pestis fractions is considerably inferior to the immunogenicity of live vaccines from immunogenic strains. The effectiveness of chemical vaccines has not yet been substantiated by epidemiological observations.

The following antigens were tested in the experiments: EV NIIEG, EV-12, EV-13, killed vaccine, and fraction 1.

48. Measles Vaccine Tested on Large Numbers of Children

"A Miraculous Vaccine"; Leningrad, Leningradskaya Pravda, 14 Jun 62, p 1

A measles vaccine, prepared under the direction of Prof A. A. Smorodintsev, corresponding member of the Academy of Medical Sciences, at the Leningrad Scientific-Research Institute of Epidemiology and Microbiology imeni Pasteur, has been tested with good results on 30,000 children in the Ukraine, Moldavia, Kirgizia, Azerbaydzhan, and Leningrad. The vaccine will eventually be given to 500,000 children in Leningrad alone. These results were reported at a meeting of the Society of Children's Physicians of Leningrad, which took place at the Military Museum. Professor Smorodintsev also reported on the results of a 4-year study of a live measles vaccine from the Department of Virology of the institute. A. T. Kuz'micheva of the Pediatrics Institute discussed clinical observations of children who received the vaccine.

49. Book on Associated Vaccines Advertised

"Assotsiirovannyye Vaktsiny (Associated Vaccines)," by B. G. Trukhmanov, Medgiz; reviewed in Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, Vol 33, No 11, Nov 62, inside back cover

The book is intended for epidemiologists, microbiologists, immunologists, and practicing physicians. Problems concerning the use of associated vaccines, their effect on the organism, the interference phenomenon, the reactogenicity of the vaccines against a background of other preparations, and their immunological effectiveness are examined in the monograph.

50. Factors Which Increase Resistance of Organism

"The Effect of Physical Training on the Immunobiological Reactivity of an Organism," by O. N. Kudryashev, Materialy Konferentsii po Probl. Adaptatsii, Trenirovki i Drygin Sposobam Povysheniya Ustoychivosti Organizma (Data From a Conference on the Problem of Adaptation, Training, and Other Means of Increasing the Resistance of an Organism), Stalino, 1960 pp 66-67 (from Referativnyy Zhurnal -- Biologiya, No 19, Oct 62, Abstract No 19R3)

"White rats were immunized with Salmonella enteritidis five times against a background of physical training of moderate and threshold severity. When training was of moderate severity, the agglutinin titer and the intensity of the opsono-phagocytic reaction rose more slowly, but to higher levels, which were maintained longer. With threshold stress, the agglutinin titer rose more slowly and did not reach high indexes, but the opsono-phagocytic reaction was decreased."

51. Polio Studies in Latvian SSR

"A Study of the Effectiveness of Live Vaccines Against Poliomyelitis (Tr. In-to Mikrobiol. AN LatvSSR -- Works of the Institute of Microbiology, Academy of Sciences Latvian SSR)," No 16, 1962, p 214 (from Referativnyy Zhurnal -- Biologiya, No 20, Oct 62, Abstract No 20B87-20B100)

The following is a list of articles on varied aspects of poliomyelities, covering approximately half of the book cited above no abstracts are given for any of these items:

"The Epidemiological Effectiveness of Live Candy Vaccine Against Poliomyelitis From A. Sabin Strains According to Data From Mass Immunization of the Population in the Soviet Union in 1960," by M. P. Chumakov, M. K. Voroshilova, S. G. Dzagurov, S. G. Drozdov, V. A. Lashkevich, L. L. Mironova, N. M. Ral'f, A. V. Gagarina, I. S. Sokolova, and K. M. Sinyak, pp 3-14

"The Epidemiology, Prophylaxis, and Prospects for the Eradication of Poliomyelitis in the Latvian SSR," by E. Yu. Yavnayst, R. I. Belyayeva, P. P. Khvatov, E. N. Kibitkina, and Ye. V. Glinskaya, pp 31-37

"First Results of Mass Immunization With Live Vaccine Against Poliomyelitis in the Latvian SSR," by K. G. Vasil'yev, pp 39-44

"A Study of the Immunological Resistance of the Digestive Tract in Children Vaccinated With Live Vaccine Against Poliomyelitis From A. Sabin Strains," by M. K. Voroshilova, Ye. A. Tol'skaya, G. A. Koroleva, V. I. Zhevandrova, Ye. N. Bartoshevich, Ye. V. Leshchinskaya, M. S. Zhukovitskiy, and M. S. Balayan, pp 67-73.

"Circulation of Type III Poliomyelitis Virus in a Children's Collective After Immunization With Three Types of," Live Antipoliomyelitis Monovaccine by S. G. Drozdov, G. A. Shirman, V. O. Tapupere, Ye. Ye. Ashmarina, and T. V. Knyazeva, pp 75-80

"On the Compatibility of Peroral Inoculation of Live Vaccine Against Poliomyelitis and BCG During the Newborn Period," by M. K. Voroshilova, M. P. Chumakov, N. N. Golubeva, G. P. Taranova, M. M. Tyurin, A. A. Yefimova, R. A. Dobrovol'skaya, I. K. Lavrova, G. A. Koroleva, V. I. Zhevandrova, L. A. Grachevaand, and L. G. Bandilenko, pp 87-98

"A Study of Cases of Poliomyelitis in Persons Vaccinated With Live Vaccine During the Vaccination Period; Report I," by E. V. Fel'dman, pp 105-111

"A Study of Serum Immunity of the Population of Riga to Polio Virus in Connection With Specific Prophylaxis of Poliomyelitis," by R. A. Kukayn, pp 113-121

"Data on the Development of Antibodies in Persons Vaccinated With Live Vaccine Against Poliomyelitis," by L. M. Ratmanayte, T. S. Podsedlovskiy, and Yu. S. Uspenskiy, pp 139-144

"A Study of the Immunological Reaction to the Introduction of Live Vaccine Against Poliomyelitis in the Newborn and Children Three Months Old," by M. Ya. Kondrashova, pp 153-174

"A Study of Virus-Neutralizing Antibodies to Polio Virus in Children During Their First Year of Life," by M. Ya. Kondrashova, 187-195

"The Effect of Inoculation With Live Attenuated Vaccines on a Disease With the Poliomyelitis Syndrome in the Belorussian SSR After Immunization in 1959-1960 (Preliminary Report)," R. I. Melamed, E. V. Fel'dman, and L. I. Nikanovich, pp 207-212

Medical Equipment

52. New X-Ray Apparatus Placed in Production by Kiev Plant

"An Apparatus for X-Ray Photography"; Kiev, Pravda Ukrainy, 14 Sep 62, p 2

"New apparatus for getting small photographic X-ray copies of the human body in full length have been manufactured at the Kiev plant of X-ray equipment. Such photographic copies are indispensable for detecting extraneous bodies that may be present in a human organism, for processing scientific and practical questions in orthopedics and prosthesis, and for examining oncological patients.

"The new apparatus was designed by a group of designers working under the direction of State prize-winner M. S. Ovoshchnikov, Photographic copies are obtained by exposing the patient to a narrow beam of rays."

Oncology

53. Discussion of Autoradiographic Studies on Incorporation of Heterologous DNA Into Novikoff Hepatoma Cells

"Autoradiographic Studies on the Incorporation of Heterologous DNA Into Novikoff Hepatoma Cells," by T. Wilczok of the Oncological Research Institute, Gliwice, Poland; Prague, Neoplasma, Vol 9, No 4, 1962, pp 369-377

Investigations on smears and slides of Novikoff hepatoma cells performed by the autoradiographic method demonstrated that preparations such as DNA-^{3}H, DNA-^{14}C, and DNA-^{32}P are able to penetrate into the cells. In this case, 600 cells were counted, with 40% showing an uptake of labeled DNA from the incubation mixture. This phenomenon is not dependent on time and temperature. The number of cells labeled with less than ten silver grains accounted for about 30-35% and cells labeled with more than 10 grains, for about 5-9% of the total cells. The penetration of radioactive materials from the whole cell into the cell nucleus is dependent on time and is increased by prolonged exposure at 0° centigrade. Under these conditions, only a slight decrease of silver grains localized on the cell surface was observed. During an increase of temperature the number of cells with large concentration of silver grains above the cell nucleus decreased, while the number of silver grains localized over the whole cell and on the cell surface does not change. The amount of incorporated DNA is dependent upon the kind of DNA present as a result of depolymerization and the residual protein content in the DNA samples. Autoradiographic studies confirm that maximum adsorption and incorporation of DNA into Novikoff hepatoma cells are reached at 120 mg DNA/300 mg cells (wet weight) in 3 ml of incubation mixture. DNase removes about 96-98% of the DNA Adsorbed on the cell surface. The reason for this phenomenon is discussed. (FOR OFFICIAL USE ONLY).

Pharmaceuticals and Biologicals

54. Preparations Affection the Nervous System

"Psychopharmacology," by A. Veyn, Candidate of Medical Sciences; Moscow, Vechernyaya Moskva, No 258, 1 Nov 62, p 3

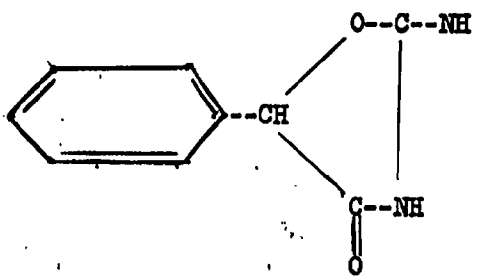
Psychopharmacology developed on a basis of the materialistic concept of psychic activity, the foundation for which was laid by I. M. Sechenov and I. P. Pavlov, Each year finds the arsenal of psychopharmacological drugs enriched by new preparations. Psychopharmacological preparations may be divided into two groups: preparations of the first group are used to alleviate irritation, diminish internal tension, allay fears, and improve

sleep; preparations of the second group are used to induce wakefulness, remove a state of depression, and improve the state of mind of the patient. Both groups beneficially affect the nervous system. There is hardly a branch of medicine in which psychopharmacology may not find application; this is particularly true of psychiatry. Considerable experimental work in connection with the effectiveness of psychopharmacological drugs in the therapy of nervous diseases is being carried out at the Laboratory of Clinical Neurophysiology by N. I. Grashchenkov, a Corresponding Member of the Academy of Sciences USSR.

55. Azoxsodon -- A Stimulant

"On the Pharmacology of 5-Phenyl-2-Imino-4-Oxo-Oxazodiline (Tradon, Azoxsodon)," by A. O. Polezhayeva, Laboratory of Pharmacology, All-Union Scientific-Research Chemicopharmaceutical Institute imeni S. Ordzhonikidze; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep/Oct 62, pp 515-519

Azoxsodon, 5-phenyl-2-imino-4-oxo-oxazodiline, was synthesized at the Chemicotechnological Laboratory of the All-Union Scientific-Research Chemicopharmaceutical Institute imeni S. Ordzhonikidize. Its structural formula is as follows:



Azoxsodon is a white crystalline powder, insoluble in water; its melting point is 256-256 degrees. Mice, rats, and cats were used in the experiments which were conducted in order to determine the pharmacological properties of the preparation. In all cases, the drug was administered into the stomach by means of a feeding tube, in doses of 10 to 1,000 milligrams per kilogram body weight. The experiments established that azoxosodon increased the motor activity of the experimental animals; considerably reduced the duration of sleep induced in barbamyl and hexenal; diminished or completely abolished the depressed state and bypothermia induced by reserpine and aminazine in mice; and induced a rise in the bioelectric activity of the brain. It had no effect on arterial pressure.

56. Antispasmotic Properties of Some of the Cholinolytics

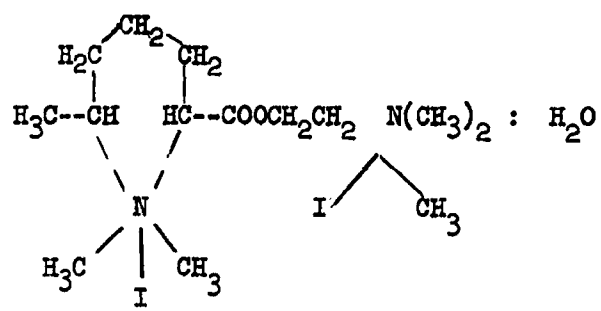
"Prophylaxis and Therapy of Experimental Hyperkinesias with Cholinolytics," by P. P. Denisenko, Department of Pharmacology, Institute of Experimental Medicine, Academy of Medical Sciences USSR; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep/Oct 62, pp 519-529

The investigation of the antispasmotic properties of a number of new cholinolytics synthesized at the Department of Pharmacology of the Institute of Experimental Medicine, Academy of Medical Sciences USSR, was the object of the experiments, the results of which are reported in this article. The preparations tested were spasmolytin, aprophen, diazil, IEM-30, IEM-60, IEM-111, IEM-58, IEM-23, IEM-112, pentaphene, tiphen, thioester-22, methyldiazil (IEM-275), methyldifacil (IEM-265), IEM-268, and tropacin. Guinea pigs, mice, and pigeons were used in the experiments which established that most of the above-mentioned cholinolytics possess antispasmodic properties; the intensity of their antispasmodic effect is proportional to the dosage administered and the specificity of their cholinolytic action; the preparations methyldiazil, diazil, pentaphene, methyldifacil, IEM-111, aprophen, IEM-112, tropacin, tiphen, and thioester-22 were found to be the more active cholinolytics; a definite relationship between the chemical structure and the action of the cholinolytics has been established.

57. Dimecoline -- A New Ganglioblocking Preparation

"On the Pharmacology of Dimecoline, a New Ganglio-blocking Preparation," by I. M. Sharapov, Laboratory of Pharmacology, All-Union Scientific-Research Chemicopharmaceutical Institute imeni S. Ordzhonikidze; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep/Oct 62, pp 533-538

Dimecoline is a domestic preparation synthesized by Ye. S. Nikitin and V. S. Susovskiy. Chemically it is the diiodomethylate of the dimethylaminoethyl ester of 1, 6-dimethyl pipecolinic acid. Its structural formula is as follows:



Dimecoline is a white, crystalline powder, readily soluble in water and boiling ethyl alcohol; its melting point is 184-186 degrees. In experiments on cats, dogs, rabbits, and rats, it was established that dimecoline is a potent ganglioblocking preparation which blocks the nicotine-cholinoreactive systems of the automatic ganglia; blocks the nicotine-cholinoreactive systems of the substantia medullaris of the suprarenalls, glomus caroticum, and the central nervous system, diminishing their sensitivity to a number of irritants; has no effect on the nicotine-cholinoreactive systems of the muscles; is capable of inducing a prolonged hypotensive effect; is little toxic; and has a stimulating effect on the smooth muscles of the uterus, intestines, and the stomach.

58. Furocumarines -- Physiologically Active Substances

"From Nature's Pharmacy," by V. Krivoshein; Frunze, Sovetskaya Kirgiziya,

Ferula, a plant of the Umbelliferae family, grows abundantly in the valleys of the Kirgizia rivers. The plant has been found to possess a number of important medicinal substances, among them antibiotics and hormones. Recently, scientists isolated a number of physiologically active substances from the plant which were named furocumarines. Preparations from these substances will soon be available at the pharmacies of the country.

59. Comparative Tuberculostatic Activity of Preparations 1314 and Phthivazid

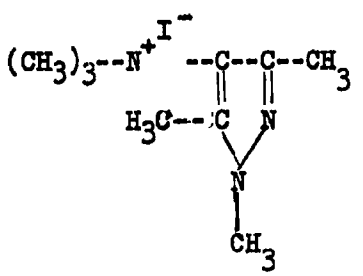
"Tuberculostatic Activity of Preparations 1314 in an Experiment," by I. R. Dorozhkova, Tr. In-ta Tuberkuloza AMN SSR (Works of the Institute of Tuberculosis, Academy of Medical Sciences USSR), 1961, 10, pp 69-73 (from Referativnyy Zhurnal Khimiya, Biologicheskaya Khimiya, No 19, 10 Oct 62, Abstract No 19 S1297)

"In experiments in vitro, preparation 1314 (I; the thioamide of alpha-ethyl isonicotinic acid) was found to be bacteriostatically less active than phthivazid (II) in relation to tubercular microbacterial cultures sensitive to II. I inhibited the growth of macrobacteria resistant to (II). In experiments carried out on mice and guinea pigs, the activity of (I) was less expressed than that of (II). Greatest chemotherapeutic activity was exhibited by (I) in experiments conducted on white rats."

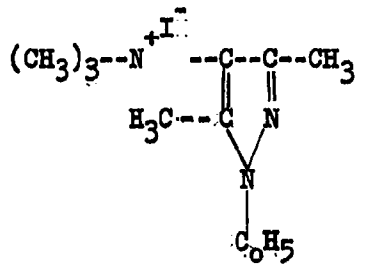
60. IEM-249 and IEM-250 -- Aminopyrazole Derivatives and Curare Antagonists

"New Curare Antagonists," by I. I. Leshchinyuk, Department of Pharmacology, Institute of Experimental Medicine USSR; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep/Oct 62, pp 547-555

Experimental data on the antagonism between IEM-249 (the iodomethylate of 1,3,5-trimethyl-4-dimethylaminopyrazole) and curarelike substances, as well as data on the effect of preparation IEM-250 (the iodomethylate of 1-phenyl-3,5-dimethylaminopyrazole) on the neuromuscular synapse, are presented in the article. The structural formulas of the preparations are as follows:



IEM-249, also known as Pyrotenz



IEM-250

Cats were used in the experiments which established that preparation IEM-249 is an active antagonist of d-tubocurarine and other curarelike substances; preparation IEM-250 has been found to possess the capacity to depress the transmission of impulses through the neuromuscular synapse; IEM-249 depresses the true cholinesterase, while IEM-250 -- pseudo cholinesterase; IEM-249 intensifies the depressing effect of decamethonium and ditilin on neuromuscular transmission.

61. Gerovit -- A New Geriatric Preparation

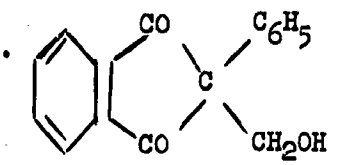
"Hungarians Discover New Wonder Drug"; Istanbul, Gumhuriyet, 11 Nov 62

Vienna (Anatolian Agency)-- The Hungarian pharmaceutical industry has, according to a recent Hungarian News Agency report, discovered a new wonder drug called Gerovit which retards the aging process in humans, improves the memory in aged persons, and improves the functioning of their digestive organs.

62. Anticoagulating Properties of Omephine

"Omephine -- a New Anticoagulant of the Indandione Group," by M. Koptelova, Institute of Organic Synthesis, Academy of Sciences Latvian SSR; Riga, Izvestiya Akademii Nauk Latviyskoy SSR, No 9, 1962, pp 110-112

Omephine, a new anticoagulant of the indiandione group, was synthesized at the Institute of Organic Synthesis of the Latvian Academy of Sciences under the guidance of Academician G. Ya. Vanaga. Chemically, omephine is 2-oxymethyl-2phenylindandione-1,3. Its chemical structure is as follows:



Omephine is a white crystalline powder, insoluble in water and readily soluble in organic solvents. Its anticoagulating properties were tested in mice, rats, rabbits, and dogs. The tests established that omephine: is an active anticoagulant; is little toxic, and acts with great speed. Variability in individual sensitivity to the preparation was noted. The prolonged administration of omephine in therapeutic doses had no effect on the hepatic and renal functions, and induced no modifications of the blood and internal organs of the animals.

63. Effect of Tetramine on Blood Sugar

"Effect of Tetramine (a New Galngliolocking Preparation Synthesized in the Latvian SSR), Administered by Differemt Methods, on the Blood Sugar (Experimental Investigation)," by D. M. Gol'ber and I. R. Runde, Tr. Rizhsk. N-I. In-ta Travmatol. i Ortopedii (Works of the Riga Scientific-Research Institute of Traumatology and Orthopedics), 1961, 6, pp 515-158 (from Referativnyy Zhurnal--Khimiya, Biologicheskaya Khimiya, No 20, 25 Oct 62, Abstract No 20 S1298)

"A single administration of tetramine (tetramethylene-bis-N-methyl piperidine diiodide) intravenously, intramuscularly, intraperitoneally, and subcutaneously caused no modifications of the amount of blood sugar in rabbits."

64. Viperalgin -- An Adder Venom

"For the Attention of Physicians," (advertisement); Moscow, Vechernyaya Moskva, No 181, 3 Aug 62, p 4

"Viperalgin, a purified toxin of the adder's venom, was received from Czechoslovakia in the pharmacies of Moscow. The preparation is used in the therapy of neuralgia, ischialgia, rhematic arthritis, polyarthritis, bronchial asthma, and other diseases. It can be administered subcutaneously, intramuscularly, and intravenously. Viperalgin is supplied in ampoules, each containing 0.1 millgrams of the active preparation. The drug is dispended by prescription only."

Physiology

65. Response Changes During Orientation Reflex Formation

"The Patern of Changes in Evoked Potentials in the Course of an Orientation Reflex," by V. G. Skrabitskiy, Laboratory of Electrophysiology, Brain Institute of the Academy of Medical Sciences USSR, Moscow; Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, Vol 48, No 10, Oct 62, pp 1, 196-1,169

A should stimulus which causes an orientation reaction increases low amplitude responses to light and reduces high amplitude responses. The sound stimulus which causes, the orientation reaction either

lenghtens or shortens the cycle of excitability of responses to light, depending on its initial duration. After the sound stimulus stops producing the orientation reaction, it ceases to influence the amplitude and the duration of cycles of excitability of responses to light. A stimulus acting as an orientation signal for an organism may either shut off or activate various channels of information of the brain, and may thereby create the most favorable conditions for the formation of an adequate response reaction.

The above conclusions were reached as result of experiments on five dogs in which electrodes were implanted according to the method developed and described by N. N. Lyubimov and L. G. Trofimov (1958).

66. Effect of Carbon Dioxide Added to Inspired Air on Oxygen Tension in Cats Discussed

"The Effect of Carbon Dioxide on Oxygen Tension in the Brain and in Skeletal Muscle During Acute Hypoxia," by N. V. Sanotskaya, Laboratory of Physiology and Pathology of Respiration and Circulation, Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow; Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, Vol 54, No 9, Sep 64, pp 46-49

This report describes experiments conducted on cats to determine the effect of carbon dioxide on oxygen tension in their brain and the ekeletal muscles during hypoxia. The experimental cats were under urethane anesthesia. It was noted when 5% - 7% carbon dioxide was added to a hypoxic mixture containing 7%, 10%, or 13% oxygen, the course of changes in the oxygen tension in various tissues is not identical. A decrease in the drop of oxygen tension in the brain was noted when carbon dioxide was added to the hypoxic misture. On the other hand, the addition of carbon dioxide to the hypoxic mixture produced an increase in oxygen tension in the skeletal muscles of cats.

67. Changes in Metabolism at Base of Increased Resistance of Rats Acclimated to Hypoxic-Hypercapnic Hypothermia

"On the Mechanism of the Increase in Resistance to Deep Hypoxic-Hypercapnic Hypothermia Brought About by Conditioning," by N. V. Korostovtseva, Laboratory of Experimental Pathology of the Institute of Blood Transfusion, Leningrad; Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, Vol 48, No 10, Oct 62, pp 1,209-1,217

The results of experiments on rats showed that intensive conditioning of warm-blooded animals to hypoxia, hypercapnia, and hupothermia results, as a rule, in the decrease of their organism's sensitivity to anoxia. A rise in resistance of warm-blooded animals to hypoxia is not always accompanied by a rise in resistance to deep hypoxic-hypercapnic hypothermia. An increase in resistance to hypothermia may be independent of an increase in resistance to hypoxia. These experiments leave no doubt that the positive effect exerted by intensive conditioning is connected with the over-all action of factors that produce acclimatization.

68. Piridrol -- a Nervous Stimulant

"On the Problem of the Effect of Piridrol on the Higher Nervous Functions of Dogs. Report I. Effect of Piridrol on the Magnitude of the Inhibitory Process," by A. Ya. Mekhedova, Tr. In-ta Vysh. Nervn. Deya-sti (Works of the Institute of Higher Nervous Functions), Academy of Sciences USSR, Physiological Series, 1961, 6, 300-307 (from Referativnyy Zhurnal--Biologiya, No 11, Jun 1962, Abstract No 11 T59, by G. Stolyarov)

"The internal administration of piridrol (meratran) to two dogs with a strong type of higher nervous function inhibits the extinguishment of a positive conditional reflex and distrubs differentiation. Dogs which received piridrol for a long period of time became restless. Piridrol weakens the processes of internal inhibition. The effect of piridol on the higher nervous functions continues for a period of seven days. However, if the experiments are begun immediately after the administration of the drug, its effect disappears within one to two days."

69. Analeptic Properties of Phenamine

"Effect of Optimal Doses of Phenamine on Extinguishing Inhibition," by A. M. Nuzhina, Tr. In-ta Vyssh. Nervn. Deyat-sti (Works of the Institute of Higher Nervous Functions), Academy of Sciences, Physiologal Series, 1961, 6, pp 318-323 (from Referativnyy Zhurnal--Biologiya, No 11, Jun 62, Abstract No 11 T61, by G. Stolyarov)

"The administration of optimal doses of phenamine to three dogs with different types of higher nervous functions (individual doses for each of the dogs) accelerated the development of extinguishing inhibition (acute intermittent inhibition). Consequently, optimal doses of phenamine intensify the process of inhibition."

70. Physiological Mechanisms of Thermoregulation Discussed

"Physiological Mechanisms of Chemical Thermal Regulations," by K. P. Ivanov, Laboratory of Ecological Physiology of the Institute of Physiology imeni I. P. Pavlov, Academy of Sciences USSR, Leningrad; Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, Vol 48, No 10, Oct 62, pp 1,225-1,233

The results of experiments on 30 rabbits and ten white rats showed that constant contracting activity of the muscles of warm-blooded animals during apparently complete rest is the most important physiological mechanism of homoiothermal animals.

Weak electric activity of the "quiescent" musculature of rabbits and white rats was observed during chilling of their organisms. This was accompanied by weak tension and mechanical muscular waves ranging in from 20 to 25 cycles. These muscular waves may be the result of contracting activity of muscular elements: they are the principal cause for metabolism in muscles during their apparently complete rest, and for the absence of cold tremor in the course of chemical thermoregulation.

71. General Characteristics of Emergence and Amplitude of a Primary Auditory Response in Cats

"Evaluation of the Functional Significance of Electrical Responses of the Auditory System," by G. V. Gershuni and N. V. Zaboyeva, Institute of Physiology imeni I. P. Pavlov, Academy of Sciences USSR, Leningrad; Leningrad, Fiziologicheskiy Zhurnal SSR imeni I. M. Sechenova, Vol 48, No 10, Oct 62, pp 1,178-1,186

This report discusses results of experiments conducted on cats to determine the nature of initial responses of the auditory area of their cortex to sound signals. It was noted that the initial response of the auditory area of the cortex of cats disappear when time constants of sound accretion reach the maximum limits for each experimental animal (120-522 milliseconds). Investigation of the amplitudes, latent periods, and limits of the initial positive wave of the primary responses during different periods of the accretion of noise amplitudes showed that the emergence of primary responses depends on the rate of changes in the amplitude of sound.

Electrodes for tapping the electrical responses were implanted into the auditory area of the cortex in cats.

The experimental cats were kept under sodium amytol anesthesia.

72. Explosiveness in Nervous Processes Characterizes Approaching Neurotic Condition in Dogs

"Concerning 'Summation Explosiveness,'" by N. N. Kudryavtseva, Physiological Department imeni Academician I. P. Pavlov, Institute of Experimental Medicine, Academy of Medical Sciences USSR, Leningrad; Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, Vol 54, No 9, Sep 62, pp 8-10

Results of experiments on dogs confirmed data previously collected by P. S. Kupalov and associates concerning explosiveness in the activity of pathologically unaffected cortical cells. It is the author's opinion that explosiveness in nervous processes may be a symptom of an approaching neurotic condition.

Public Health

73. Mortality and Morbidity Reduced in USSR

"Reduction of Morbidity Rate Among the Population is the Most Important Task of Organs of Public Health"; Sovetskoye Zdravookhraneniye, No 9, Sep 62, pp 3-4

This article summarizes briefly the current status of public health service in the USSR. Figures are presented which show that the general mortality rate in the Soviet Union during 1961 was the lowest in the world. Infant mortality statistics compiled in 1961 show that there are 33 infant deaths per 1,000 births in the USSR. Infant mortality in many oblasts and cities of the Ukraine is 16.7-19.0 per 1,000 births.

Only isolated cases of smallpox, cholera, plague, and relapsing fever have been encountered. Only 360 cases of malaria were recorded during 1961. The incidence of diphtheria has been lowered by 4.7 times; polimyelitis, by 4.6 times; and whooping cough, by 24%. All this has been done within the past 5 years.

The incidence of tuberculosis was cut in half, and death from tuberculosis was reduced by 4 times during the period from 1950 through 1961. The number of people affected with active forms of syphilis decreased by 17 times during that same period. Only 18 cases of trachoma were recorded in the Belorussian SSR during 1961.

Scientists must strive to develop new methods of diagnosis, treatment, and prevention diseases of the cardivascular system, neoplasms, influenza, angina, etc.

Radiation Sickness

74. Effective Use of β-Mercaptoethylamine During Acute Radiation Sickness

"The Protective Effect of β-Mercaptoethylamine During Acute Radiation Sickness," by M. S. Isayev, Department of Experimental Oncology, Kiev Scientific Research Roentgenological-Radiological and Oncological Institute; Baku, Azerbaydzhanskiy Meditsinskiy Zhurnal, No 10, Oct 62, pp 36-42

The initial administration of β-Mercaptoethylamine hydrochloride following a single general x-ray irradiation of rats by 1,200 r alleviated the course of radiation sickness, prolonged the lifespan, and increased the survival of the irradiated animals.

β-Mercaptoethylamine hydrochloride exerted a protective effect when used infrequently (every fifth day) after general fractional irradiation; when used more frequently (every third day) its effect was insignificant, and when used more freqently (every other day), it exerted a deleterious effect and the death rate of the experimental animals was higher than that of the controls (irradiated by not treated).

β-Mercaptoethylamine possesses a toxic effect which is especially pronounced when the preparation is used frequently.

The protective effect of β-mercaptoethylamine hydrochloride is greater followinf a single general irradiation than fractional irradiation.

75. Therapeutic Use of Streptomycin in Radiation Sickness

The Use of Streptomycin in the Prophylaxis of Acute Radiation Sickness", by L. F. Semenov, Institute of Experimental Pathology and Therapy, Academy of Medical Sciences USSR, Sukhumi; Moscow, Antibiotiki, Vol 7, No 10, Oct 62, pp 912-916

A single dose of streptomycin, dihydrostreptomycin, and a blend of streptomycin with penicillin used simultaneously immediately prior to irradiation by a single dose of 1,050-1,100 r of gamma-rays from Co^{60} exerted no protective effect on mice.

Streptomycin used in combination with sulfur-containing or amino-containing agents for the prophylaxis of radiation sickness lowered the antiradiation protective effect of the agents.

Streptomycin used from the second day after irradiation exerted a positive therapeutic effect and increased the prophylactic effect of the agents.

76. Disrupted Hemopoiesis Linked to Radiation-Disturbed Bone Marrow Innervation

"Morphological Disruptions of Bone Marrow Innervation During the Initial Phases of Acute Radiation Sickness," by A. A. Otelin, Chair of Anatomy, Kursk State Medical Institue; Moscow, Arkhiv Anatomii, Gistologii i Embriologii, Vol 42, No 4, Apr 62, pp 34-38

Nerves of the bone marrow in the vertebrae and in the epiphyses of the long tubular bones of the extremities of 40 dogs, both under normal conditions and after x-ray irradiation by 640 r doses, were studied. Microtome sections were not decalcified, and were fixed and read in a steriosopic MBS-1 microscope.

Immediately, 24 hours, and 3 days after irradiation, morphologically substantiated changes could be detected in the red bone marrow during acute radiation sickness; according to the author these changes coule be linked to disruptions in hemopoiesis rather than to the direct effect of ionizing radiation.

Surgery

77. Mechanizing Difficult Operative Procedures Discussed

"Artificial Organs," by Honored Scientist Prof M. Chachava; Tbilisi, Zarya Vostoka, 24 Aug 62, p 4

Attempts are being made to mechanize some of the most difficult surgical procedures. Several devices born of this effort have been used in Soviet hospitals which "revolutionized" various aspects of surgery.

One of the most widely acclaimed instruments is an artificial "heart-lung", Connected by means of plastic tubes to a patient's main blood vessels, the "heart-lung" device draws of venous blood, purifies it, and drives it toward the main artery with pulsating jolts (at the rate of 70 beats per minute). The blood, diffused throughout the entire organism, provides normal nutrition and metabolism. Any kind of an operation that lasts an hour can be performed on an exsanguinated heart. After the operation is over, the heart is sutured and begins to function normally. The artifical heart is detached within 10-20 minutes after the operation is over.

The artificial "heart-lung" can successfully replace the heart and lungs of a patient for a period of 2 hours. The device was invented at the Scientific Research Institute of Surgical Apparatuses in Moscow.

An apparatus for artificial chilling of an organism is of great importance in heart surgery. It has been shown experimentally that when the temperature of the body is reduced, metabolism in the tissues decreases and the activity of the organism slows down, making it easier for the organism to tolerate insufficient blood or trauma. This method was used in congenital vitium cordis surgery. A portable, easily regulated apparatus for artificial chilling which is now available draws off blood from the principal veins and let it pass through a special unit. The blood is forced back into the patient's blood vessels in a chilled form. Results of experiments showed that it is possible to reduce the body temperature of a patient to 28°C within minutes, and even to 12°C-16°C.

Surgeons of the Georgian SSR have been using special instruments to extend venous openings in cases of acquired vitium cordis. These instruments are being manufactured by a Ministry of Health workshop directed by G. Tatishvili.

A large number of diseases such as aneurysm, endarteritis, and thrombosis affect patients in such a manner that it become necessary to removed the affected large blood vessels. Artificial blood vessels made of nylon, taflon, perlon or other synthetic materials were found to be able to perform all the complex functions required of natural blood vessels.

"Artificial Kidneys," equipped with an electric motor, have been successfully used. Inventors have devised replacements for extremities, eyes, and maxillae. It is the opinion of the author of this report that artificial hearts and lungs, kidneys, and other organs of the body will be used more and more extensively in years to come.

78. Bone Marrow Storage by Ultrarapid and Deep Freezing

"Bone Marrow Storage by Ultrarapid and Deep Freezing," by N. S. Pushkar', Chair of Surgery of the Ukrainian Institute for the Advanced Training of Physicians, and of the Pathophysiological Laboratory of the Ukrainian Institute of Medical Radiology; Moscow, Ortopediya, Travmatologiya i Protezirovaniye, No 9, Sep 62, pp 30-34

A total of 116 tests were conducted on the feasibility of bone marrow storage by ultrarapid and deep freezing for 2-35 days.

Results showed that ultrarapid and deep freezing of bone marrow cells down to -183° to -196°C had advantages over storage at temperatures ranging between zero to 4°C.

A 15% glycerine solution in Hank's solution preserves the cell viability for a long time, i.e., a month or longer, at low temperatures.

Cells preserved in suspension form are preserved best of all.

The method of ultrarapid and deep freezing may be used in surgical practice for storing not only bone, cartilage, skin and other tissues, as well as bone marrow.

79. Vishnevskiy Interview in Yugoslavia

"Harmony of the Hand and Scalpel," Belimir Petrovic; Belgrade, Borba, 21 Oct 62, p 4

Academician Prof A. Vishnevskiy is reported to have spent several days in Yugoslavia while attending a congress of Yugoslav surgeons.

During a break between sessions of the congress, he was asked to comment, among other things, on organ transplants, but was somewhat noncommittal, noting that this surgical area was "a thing of the future." When pressed further, he stated that incompatibility and the resulting production of antibodies represents the greatest barrier in organ transplanting, and that "Soviet scientists are doing a great deal of work on this, but the results are not satisfying," noting that experiments are performed only with animals.

When the Borba correspondent asked if, as reports said, Soviet surgeon Demikhov was going to transplant the leg of a dead woman to a girl, Vishnevskiy refuted this, saying that he and Demikhov had worked together, and that Demikhov experimented only with animals.

Vishnevskiy noted that at present Soviet surgeons are successfully transplanting skin, corneas, bone, and cartilage, but that the new tissue is only temporarily compatible with the organism, "since it has been determined that the organism has more rapid and better compatibility with its own tissue."

Vishnevskiy noted great achievements in the use of prostheses such as blood vessesl and aortas and reportedly said that experimental operations with plastic heart valves are being performed.

When asked what his opinion was on the ever-deminishing blood supply with a greater number of surgical cases, Vishnevskiy said that the problem could be solved through increased numbers of blood donors or that a "Modern chemical substitute for blood would have to be found."

Vishnevskiy commented, when asked about such cases, that the heart could be revived 2-3 hours after death by transmitting "nourishing liquid with oxygen" through the heart, but he noted that the man still cannot be revived because of irreversible damage to the central nervous system. He reported that heart, lungs, liver, and digestive organs function, but the man neither regains consciousness or movement. When asked if this was an insurmountable barrier, Vishnevskiy replied, "We shall see."

Therapy

80. Bulgarians Use Liquid Nitrogen To Treat Skin Diseases

"New Method for Treating Skin Diseases," by Drs V. [illegible] and D. Vasilev; Sofia, Zdraven Front, 22 Sep 62, p 2

More than a year ago Dr. St. Stoyanov, senior scientific associate at the Scientifc Research Institute for Dermatology and Veneral Diseases, and Dr. V. Naumova, chief of the laboratory of physiotherapy at the Urban Dermatological and Veneral Dispensary-Clinic in Sofia, began treating skin disorders with liquid nitrogen. The results have been so encouraging that the treatment has been introduced at the Higher Military Medical Insitute. Presently, over 1,000 patients have been successfully treated with liquid nitrogen. It has been used to treat warts, verrucose formations, pointed condylomas, papillomas of the mucous membrane, neurodermatitis, and rosacea.

Toxicology

81. Effect of Cadmium Sulfate and Methylene Blue on Curare-Like Substances

"Effect of Thiol Intoxicants on Curare-Li,e Substances," by I. V. Komissarov, Chair of Pharmacology Donetsk Medical Institute imeni A. M. Gorkiy; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep-Oct 62, pp 543-547

Cats under urethan anesthesia were used in the experiments which were conducted to determine the effect of some of the thiol intoxicants on curare-like substances and sulfhydryl groups. Displacin and d-tubocuraine

chloride were administered to the animals as surare-like substances of a concurrent type of action; cadmium sulfate and methylene blue as thiol intoxicants, and unithiol as a donor of sulfhydryl groups. The experiments established that cadmium sulfate and methylene blue diminish or completely abolish the effects of curare-like compounds of a concurrent type of action; they separate the curare-like compounds from their combinations with cholinoreceptors; curare-like compounds and thiol intoxicants interact with different functional groups of the same cholinoreactive structures of the skeletal muscles.

82. Effect of Some Preparations on Cholinesterase Activity

"Concerning the Problem of Cholinergic Metabolism Under Normal Conditions, and Under Conditions of Some Intoxications and Infectious Diseases," by A. Vasina, and Yu. P. Kvitkin, Sb. Nauchn. Rabot Saratovsk. N.-I. Vet. Sta. (Collection of Scientific Works of the Saratov Scientific-Research Veterinary Station), 1961, 5, pp 19-24 (from Referativnyy Zhurnal -- Khimiya No 19, 10 Oct 62, Abstract No 19 S1247)

"Investigations of the activity of cholinesterase on different organs of blood of cattle, sheep, rabbits, guinea pigs, and hens established that under normal conditions the greatest amount of cholinesterase is to be found in the cerebral tissues. Calcium arsenite, NaF, NaCN, and ricin in lethal doses depress cholinesterase activity. The authors point to the important role which cholinesterase depression plays in the mechanism of the toxic action of As, F. CN, and ricin preparations and in the pathogenesis of dyspepsias, colibacillosis, and laringotracheitis."

83. Modification of Pyruvic Acid Content of Tissues

"Effect of Type B Botulinum Toxin on the Pyruvic Acid Level in the Tissues of Guinea Pigs," by Z. P. Pak, Chair of Pharmacology and the Central Scientific-Research Laboratory, Second State Moscow State Medical Institute imeni N. I. Pirogov; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep-Oct 62, pp 614-617

The determination of the pyruvic acid content in the tissues of the central nervous system, mucles, and blood of guinea pigs following the administration of type B obtulhum toxin to the animals was the object of the experiments described in the article. The toxin was administered to the animals intramuscularly in minimal LD. Twenty minutes later the animals were killed. The colorimetric method was used to determine the pyruvic acid content. The experiemtns established that the toxin produced

modifications of the pyruvic acid content in central nervous system, mucles and blood of the guinea pigs; modifications varied in their intensity and direction; the level of the acid in the medulla oblongata and the spinal cord decreased; no changes were noted in the level of the acid content in the cerebral hemispheres; and there was an accumulation of the acid in muscles and blood.

84. Some Data on Chronic Mercury Intoxication

"Some Data on the Interrelationship of the Higher Nervous Functions and Chronaxy in Mercury Intoxication," by M. M. Gimadeyev, Materialy Obshcheinstitutsk. Nauchn, Konferentsii Posvyashchenoy 40-letiyu So Dnya Osnovyaniya Tatarsk ASSR (Data on the General Institute Scientific Conference Dedicated to the 40th Anniversary of the Establishment of the Tatar ASSR) (Kazan' Medical Institute, No 10), Kazan', 1960, pp 278-280 (from Referativnyy Zhurnal -- Biologiya, No 11, Jun 62, Abstract No 11 T305, by R. Vorob'yeva)

"Rabbits were subjected to the action of mercury vapors in concentrations of 0.00001 to 0.000015 milligrams per liter six hours daily for a period of 6 months. By the end of the second month the release of differentiations and the appearance of intersignal reactions were noted; somewhat later, a leveling phase accompanied by a slight increase in chronaxy set in. For a period of 3 to 4 months, internal active inhibition continued to weaken, diffused inhibition developed :prolongation of the latent period, disappearance of single conditiones reflexes), and a paradoxical phase appeared. Chronaxy was intensified by four to six times as compared with its initial state. Two months after the poisoning process the higher nervous functions and neuromuscular excitability were restored to normal. It was established also that modifications of the higher nervous functions and neuromuscular excitability are completely congruent."

85. Toxicity of Nitrocyclohexane -- an Intermediary Product in Production of Caprolactam

"Experimental Data on the Toxicology of Nitrocyclohexane," by V. A. Savelova and V. V. Russkikh, Moscow, Scientific-Research Institute of Hygiene imeni F. F. Erisman; Moscow, Farmakologiya i Toksikologiya, Vol 25, No 5, Sep/Oct 62, pp 622-628

Rats and rabbits were used in the experiments which were conducted to determine the toxicity of nitrocyclohexane, an intermediary product in the production of caprolactam, the initual raw material used in the manufacture of capron. Nitrocyclohexane, $C_6H_{11}O_2N$, is a colorless liquid having a pleasant odor; it boils at a temperature of 205.5-206 degrees; its melting point is 34 degrees; its specific gravity is 1.068. It is readily soluble in organic solvents, but poorly soluble in water. The experiments established that the average lethal dose of nitrocyclohexane when administered intothe gastro-intestinal tract is 54.2 milligrams per kilogram body weight; the absolute lethal dose is 80 milligrams per kilogram body weight; the maximum tolerated dose is 35 milligrams per kilogram body weight; the oral chronic administration of the preparation to rabbits in doses of 1.5 to 0.5 milligrams per kilogram body weight induced modifications in the hepatic glycogen forming funtions and caused pathomorphological changes in the central nervous system, liver, and kidneys.

86. Toxicity of Oxymethylate of Remerine

"On the Pharmacology of a Derivative of the Aladkloid Remerine," by S. F. Fakhrutdinov and I. K. Kamilov, Vopr. Ispolzovaniya Mineral'n. i Rastit. Syr'ya Sred. Asii (Problems on the Utilization of the Mineral and Vegetable Raw Material of Central Asia), Taskent, Academy of Sciences Uzbek SSR, 1961, pp 181-188 (from Referativnyy Zhurnal -- Khimiya, Biologicheskaya Khimiya, No 18, 25 Sep 62, Abstract No 18 S1476)

"The oxymethylate of remerine (I) $C_6H_2(CH_2O_2)$ $[N(CH_3)_2OH]$ when administered subcutaneously to rabbits in doses of only 10 milligrams per kilogram body weight induced the drooping of the head. A maximal effect was observed when doses of 25 milligrams per body weight were administered. Forty milligrams per kilogram body weight of (I) were required to produce a curare-like effect; this dose killed the animals within five minutes. Curare-like action was also induced in dogs when preparation was administered intravenously in doses of five miligrams per kilogram body weight; 11 to 12 were found to be lethal. The preparation is an antagonist of strychnine and proserine."

87. Effect of Uranyl Nitrate on Some Pharmacological Substances

"Concerning the Nature of the Action of Certain Pharmacological Substances Following Uranium Affection," by A. M. Ivanitskiy; Moscow, Farmakologiya i Tiksikologiya, Vol 25, No 5, 1962, pp 631-634

Results of experiments which were conducted to determine the effect of uranyl nitrate on the action of atropine, caffeine, strychnine, cordiamin, and novocaine when introduced into the organism are reported in the article. Male albino rats 160 to 200 grams in weight were used in the experiments. Uranyl nitrate in doses of 200 milligrams per kilogram body weight were administered to the animals per os. Solutions of the pharmacological substances were injected into the vena femoralis of the animals at the rate of 0.02 milliliters per 5 seconds. The experiments established that uranyl nitrate increased the reactivity of the organism to atropine; decreased the reactivity of the organism to strychnine and novocaine; large doses of caffeine, strychnine, and cordiamin were required to induce a spasmodic effect in the animals poisoned by urnayl nitrate.

V. SCIENCE NEWS ITEMS

Aid to Underdeveloped Countries

88. Bulgarian Gifts to Algeria

"What Is New in the World"; Moscow, Komsomolskaya Pravda, 23 Oct 62, p 1

"The Bulgarian ship Rodina arrived in Algiers bringing gifts from Bulgaria to the people of Algeria -- medicines, produce, textiles and window glass."

89. Soviets Send Surgican Instruments to India

"For Medical People of India;" Moscow, Leninskoye Znamya, 21 Sep 62, p 4

"Delhi, 20 September. (Tass). G. P. Velikiy, trade representative of the USSR in India, delivered a gift to the Minister of Health of India, Mme. Sushila Nayyar. The gift consisted of a set of USSR-manufactured modern surgical instruments. Complicated operations on lungs and in the area of the gastrointestinal tract can be performed with the aid of these instruments."

Conferences

90. Woman "Reads" Printed Texts With Her Fingers

"Tagil Wonder"; Moscow, Vechernyaya Moskva, 30 Oct 62, p 3

Recently the Scientific Conference of the Ural Branch of the All-Union Society of Psychologists was held in the city of Nizhniy Tagil.

A report by physician-psychiatrist N. M. Gol'dberg created excited interest among the participants. In June of 1962, Gol'dberg brought to the Department of Pedagogy and Psychology of the Nizhne-Tagil Pedagogical Institute a report on one of his patients. This woman, Roza K., could read an ordinary printed text and could also recognize colors blindfolded, using only the fingers of her right hand.

Gol'dberg brought Roza to the conference, where she demonstrated her exceptional ability. She could, for example, reach into an opaque bag and pick out an object of a certain color. Also, by touching photographs of people she was able to determine their pose and external appearance. However, she was unable to determine cards or to read texts which were covered with celluloid film or glass. It is obvious that Roza feels with her fingers distinctions in the structure of dye-stuffs.

It must be remarked that this fine tactile sense was in this case consciously developed. Roza persistently trained herself in reading texts and in recognizing colors blindfolded, and gradually learned to do it.

These experiments are of interest not only to psychologists, but also to philosophers. There is disagreement as to whether color is a real property of things or only a subjective sensation of man. In the opinion of the author (Candidate of Pedogogical Sciences and Docent at the Nizhneiy-Tagil Pedagogical Institute A. S. Movomeyskiy), the recognition of colors with the fingers shows that color is an objective property of things, existing independent of man.

91. Pest Control Conference Reported

"Conference on Biomethods"; Moscow, Zashchita Rasteniy ot Vrediteley i Bolezney, No 5, May 62, p 45

"In January 1962, the Administration of Plant Protection, Ministry of Agriculture RSFSR held a conference on the biological method of controlling pests of agricultural crops, at which reports of oblast stations and laboratories were heard.

"The feasibility of treating caterpillars of apple and cabbage moths, and cabbage and turnip butterflies with enterobacterin 3 was emphasized in the reports. The preparation gives especially good results when Trichogrammatidae are released at the same time. According to the information of the Vornezh station, up to 72% of the turnip butterfly larvae, 86% of the cabbage moths, and 91% of the cabbage butterflies (1961) were killed. It is expedient to employ enterobacterin with microdoses of DDT which weakens the pest organism and makes it more susceptible to the biological preparation.

"High effectiveness is achieved by the use of Trichogrammatidae in the control of cutworms (Kazan station). In certain northern rayons of Kirovskaya Oblast where egg-eaters have been released, chemical agents have not been used.

"The conference has noted that a number of stations (Voronezhskaya, Belgorodskaya) still pay scant attention to farm testing of biological control, although these data should form the basis for the recommendation of one method or another.

"A resolution concerning the necessity for the broad introduction of well recommended biological preparations and entomophages into practice should be adopted."

92. International Nephrological Congress in Czechoslovakia

"Second International Nephrological Congress;" Prague, Casopis Lekaru Ceskych, Vol 101, No 44, 2 Nov 62, p 1,327

The Second International Nephrological Congress will be held in Prague on 26-30 August 1963 under the auspices of the International Nephrological Society. The committee of this society will decide on the acceptance of reports for presentation at the congress. Summaries of proposed reports (not to exceed 200 words) in any of the languages to be used at the congress (English, French, and Russian) are to be submitted by 1 February 1963. Applications to attend the congress are to be submitted by 1 April 1963. Manuscripts of addresses, which are accepted for publication in the bulletin, must be submitted in complete formby June 1963. No payment will be made to authors for publication of such addresses. Czechoslovak participants of the congress will pay a fee of 100 crowns. This does not include the cost of the bulletin which may be purchased in 1964.

Preliminary applications for participation in the congress will be submitted to Dr J. Jirka, General Secretary of the Congress, Institute for Circulatory Diseases, Prague-Krc. The applications are to give the applicant's name, address, place of employment, position, and title of any proposed report. Applicants will later receive a program and all additional materials pertaining to the congress. (FOR OFFICIAL USE ONLY)

93. Forthcoming Ophthalmological Congress in Czechoslovakia

"Medical Societies"; Prague, Casopis Lekaru Ceskych, Vol 101, No 43, 26 Oct 62, p 1,303

On the occasion of 100th anniversary of the publication of the experimental findings of J. G. Mendel, the Ophthalmology Section of the "Jan Ev. Purkyne" Czechoslovak Medical Society will hold a national conference with international participation in Brno during the second half of May 1965. The main topic will be "Genetics in Ophthalmology." The sub-topics will be: (1) Biological, biochemical, and cytogenetic bases of human heredity; (2) Experimental and clinical findings on the heredity of healthy and unhealthy stigmata of the eye with primary attention to disorders of

the motility of the eye or lens, intraocular pressures, refractive disorders and diseases of the retina; (3). Genetic hygiene-eugenics; and, (4). Free topics. The main sub-topics will be examined by speakers in blocks. Discussion will be moderated. Lectures may be delivered in Czech, Slovak, Russian, and English. The Preparatory Committee will provide additional information. The Ophthalmological Clinic of the Faculty Hospital in Brno, Pekarska 53, has been charged with the organization of the congress. Prof Dr Jan Vanysek is chairman of the Preparatory committee; Milan Vrba, Graduate Physician, is the scientific secretary; and Dr Kveta Kvapilikova and Zdenka Brabcova comprise the organizational secretariat. (FOR OFFICIAL USE ONLY). (COPYRIGHT by the State Medical Publishing House, Prague, 1962)

94. Congress on Physical Training Medicine in Czechoslovakia

"Medical Societies"; Prague, Casopis Lekaru Ceskych, Vol 101, No 45, 9 Nov 62, pp 1,359-1,360

The Section for Physical Training Medicine of the Czechoslovak "Jan Ev. Purkyne" Medical Society, in cooperation with the International Federation for Physical Training Medicine and the Czechoslovak Society for Physical Training, will conduct the First European Congress on Physical Training Medicine on 10-12 June 1963 in Prague. The primary topic will be: "Lungs, Breathing, and Sports (Physiology, Clinic, Traumatology, and Physical Therapeutic Training)." A symposium on symptomology and defnintion of overtraining and strain will be held on the second day. The third day has been reserved for free reports by the guests. Official languages of the congress will be Czech, Russian, English, French, and German. All presentations will be simultaneously translated into these languages. Presentations related to the primary topic may be presented but are not to exceed 10 minutes. Applications for participation in the congress are to be submitted not later than 30 November 1962 to the Secretariat, Section for Physical Training Medicine, Prague 2, Salmonovska 5. Applications for presentation of papers, giving the title and a summary (not exceeding 40 words) are to be submitted to the same address by 15 February 1963. Prof Dr Jiri Kral is chairman of the congress and Docent Dr L. Schmid is secretary.

95. Neurosurgical Conference in Czechoslovakia

"Neurosurgical Congresses and Conferences"; Prague, Rozhledy v Chirurgii, Vol 41, No 9, 1962, p 693

A joint Czechoslovak-British neurosurgical conference will be held in Prague in 1964 with the Czechoslovak Neurosurgical Commission having organizational responsibility. (FOR OFFICIAL USE ONLY) (COPYRIGHT by the State Medical Publishing House, Prague, 1962)

* * *

UNCLASSIFIED
Central Intelligence Agency

Washington, D.C. 20505

7 September 2004

Ms. Roberta Schoen
Deputy Director for Operations
Defense Technical Information Center
7725 John J. Kingman Road
Suite 0944
Ft. Belvoir, VA 22060

Dear Ms. Schoen:

In February of this year, DTIC provided the CIA Declassification Center with a referral list of CIA documents held in the DTIC library. This referral was a follow on to the list of National Intelligence Surveys provided earlier in the year.

We have completed a declassification review of the "Non-NIS" referral list and include the results of that review as Enclosure 1. Of the 220 documents identified in our declassification database, only three are classified. These three are in the Release in Part category and may be released to the public once specified portions of the documents are removed. Sanitization instructions for these documents are included with Enclosure 1.

In addition to the documents addressed in Enclosure 1, 14 other documents were unable to be identified. DTIC then provided the CDC with hard copies of these documents in April 2004 for declassification review. The results of this review are provided as Enclosure 2.

We at CIA greatly appreciate your cooperation in this matter. Should you have any questions concerning this letter and for coordination of any further developments, please contact Donald Black of this office at (703) 613-1415.

Sincerely,

Nancy Tatro Carter for

Sergio N. Alcivar
Chief, CIA Declassification Center,
Declassification Review and Referral
Branch

Enclosures:

1. Declassification Review of CIA Documents at DTIC (with sanitization instructions for 3 documents)
2. Declassification Status of CIA Documents (hard copy) Referred by DTIC (with review processing sheets for each document)

Processing of OGA-Held CIA Documents

The following CIA documents located at DTIC were reviewed by CIA and declassification guidance has been provided.

OGA Doc ID	Job Num	Box	Fldr	Doc	Doc ID	Document Title	Pub Date	Pages	Decision	Proc Date
AD0463342	78-03109A	55	1	2	88	Consolidated Translation Survey For April 1965	4/1/1965	190	Approved For Release	3/25/2004
AD0465168	78-03109A	55	1	3	89	Consolidated Translation Survey For May 1965	5/1/1965	245	Approved For Release	3/25/2004
AD0467068	78-03109A	55	1	4	90	Consolidated Translation Survey For June 1965	6/1/1965	221	Approved For Release	3/25/2004
AD0468849	78-03109A	55	1	5	91	Consolidated Translation Survey For July 1965	7/1/1965	218	Approved For Release	3/25/2004
AD0471155	78-03109A	55	1	6	92	Consolidated Translation Survey For August 1965	8/1/1965	236	Approved For Release	3/25/2004
AD0473500	78-03109A	55	1	7	93	Consolidated Translation Survey For September 1965	9/1/1965	221	Approved For Release	3/25/2004
AD0474384	78-03109A	55	1	8	94	Consolidated Translation Survey For October 1965	10/1/1965	181	Approved For Release	3/25/2004
AD0475860	78-03109A	55	1	9	95	Consolidated Translation Survey For November 1965	11/1/1965	305	Approved For Release	3/25/2004
AD0477388	78-03109A	56	1	1	96	Consolidated Translation Survey For December 1965	12/1/1965	181	Approved For Release	3/25/2004
AD0478471	78-03109A	56	1	2	97	Consolidated Translation Survey For January 1966	1/1/1966	198	Approved For Release	3/25/2004
AD0479675	78-03109A	56	1	3	98	Consolidated Translation Survey For February 1966	2/1/1966	354	Approved For Release	3/25/2004
AD0481681	78-03109A	56	1	4	99	Consolidated Translation Survey For March 1966	3/1/1966	237	Approved For Release	3/25/2004
AD0334379	78-03117A	191	1	37	4255	Status And Activities Of Prominent Scientists In Communist China In 1962	1/29/1963	53	Approved For Release	3/29/2004
AD0333974	78-03117A	190	1	35	4212	Scientific Information Report Outer Mongolia (1)	1/17/1963	27	Approved For Release	3/29/2004
AD0335202	78-03117A	195	1	13	4394	Scientific Information Report Outer Mongolia (2)	3/13/1963	27	Approved For Release	3/25/2004
AD0332657	78-03117A	183	1	13	3924	Scientific Information Report Biology And Medicine (22)	10/12/1962	76	Approved For Release	3/29/2004
AD0333147	78-03117A	185	1	30	4020	Scientific Information Report Biology And Medicine (23)	11/16/1962	90	Approved For Release	3/29/2004
AD0333427	78-03117A	188	1	13	4112	Scientific Information Report Biology And Medicine (24)	12/13/1962	84	Approved For Release	3/29/2004
AD0334160	78-03117A	190	1	10	4187	Scientific Information Report Biology And Medicine (25)	1/10/1963	69	Approved For Release	3/29/2004
AD0334612	78-03117A	193	1	10	4310	Scientific Information Report Biology And Medicine (26)	2/20/1963	112	Approved For Release	3/29/2004
AD0335309	78-03117A	195	1	32	4413	Scientific Information Report Biology And Medicine (27)	3/20/1963	110	Approved For Release	3/29/2004
AD0336242	78-03117A	198	1	16	4509	Scientific Information Report Biology And Medicine (28)	4/12/1963	81	Approved For Release	3/29/2004
AD0332575	78-03117A	184	1	6	3957	Scientific Information Report Chemistry And Metallurgy (22)	10/23/1962	47	Approved For Release	3/29/2004
AD0333164	78-03117A	187	1	2	4061	Scientific Information Report Chemistry And Metallurgy (23)	11/28/1962	65	Approved For Release	3/25/2004
AD0333857	78-03117A	189	1	22	4160	Scientific Information Report Chemistry And Metallurgy (24)	1/2/1963	57	Approved For Release	3/29/2004
AD0334310	78-03117A	191	1	20	4238	Scientific Information Report Chemistry And Metallurgy (25)	1/28/1963	52	Approved For Release	3/29/2004